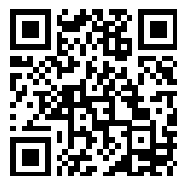
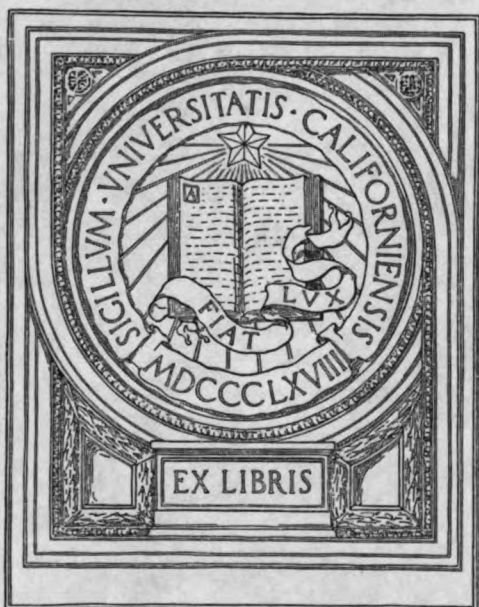

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, January, 1915—No. 1

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instructions, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States, and will contain information concerning Government, commercial, and special stations only. Information regarding amateur stations will appear only in the annual edition of the list of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) will be printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws will be printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.

INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.

Nature of service:

PG=General public.

PR=Limited public or limited commercial.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

fr.=Franc (franca).

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in francs and dollars.

Notes =Refers to notes in the Berne list.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Additions to the list of Radio Stations of the United States, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.	Service.	Hours.
Benton Harbor, Mich. ¹	O 86 28 21 N 42 06 42	WIZ	125	Marconi, 125...	300, 500, 600	PR ² ...	X.
Huntington Harbor, Northport, N. Y. ³	.....	WLM	.....	.....	.....	.....	.....
Oakland, Cal. ⁴ ...	O 122 16 14 N 37 48 41	KGI	200	Composite, 540	300, 500, 600	P.....	X.
Passagrille, Fla. ⁵	O 82 45 00 N 27 42 00	WRG	20	.....	300, 450, 600	PG ⁶ ...	8.30m-11.30m. 1.30s- 3.00s. 4.30s- 6.30s. 7.30s-10.00s.
St. Petersburg, Fla. ⁷	O 82 38 27 N 27 46 28	WIX	25-50	.....	300, 450, 600	PR ⁸ ...	8.30m-11.30m. 1.30s- 3.00s. 4.30s- 6.30s. 7.30s-10.00s.

¹ Radio station operated and controlled by the Graham & Morton Transportation Co.² The vessel communicates only with vessels of the Graham & Morton Transportation Co.³ Radio station operated and controlled by W. K. Vanderbilt, jr.⁴ Radio station operated and controlled by Ellery W. Stone.⁵ Radio station operated and controlled by C. A. Brown.⁶ The station also communicates with a land station at St. Petersburg (WIX), Fla. The rates for this station are as follows:

	Per word.	Minimum per radiogram.
Ordinary day messages.....	2 c. (0.10 fr.)	(10 words) 35 c. (1.75 fr.)
Ordinary night messages.....	2 c. (0.10 fr.)	(10 words) 25 c. (1.25 fr.)
Day letters.....	4 c. (0.20 fr.)	(50 words) 55 c. (2.75 fr.)
Night letters.....	2 c. (0.10 fr.)	(50 words) 35 c. (1.75 fr.)

⁷ Radio station operated and controlled by C. C. Brown.⁸ The station is limited to correspondence with a land station at Passagrille (WRG), Fla. Rates for this station same as Passagrille (no ship service).

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the list of Radio Stations of the United States, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Ship rate.	
				Per word.	Minimum per radiogram.
Addison E. Bullard ¹	KWL		300,600		
Alberta ²	KZA				
Baton Rouge ³	KSG		300,600		
Bayway ⁴	KSR		300,600		
Brockton ⁵	KNH		300,600		
Caddo ⁶	KSK		300,600		
Caloria ⁷	KSP	Marconi.....	300,600	4 c. (0.20 fr.)	40 c. (2 fr.)
Charles E. Harwood ⁸	WID	do.....	300,600	4 c. (0.20 fr.)	40 c. (2 fr.)
Charlton Hall ⁹	KLU		300,600		
Colusa ¹⁰	WIN	Marconi.....	300,600	4 c. (0.20 fr.)	40 c. (2 fr.)
Craster Hall ¹¹	KLK		300,600		
Cushing (KSC) ¹²	KSC		300,600		
De Soto ¹³	KNI		300,600		
Edward L. Doheny ¹⁴	WIE		300,600	4 c. (0.20 fr.)	40 c. (2 fr.)
Emeline ¹⁵	KZD				
Francis Hanify ¹⁶	KRA	Marconi, 1,000...	300,600	4 c. (0.20 fr.)	40 c. (2 fr.)
Gargoyle ¹⁷	KRK		300,600		
Great Northern ¹⁸	WIR	Marconi, 1,000...	300,600	4 c. (0.20 fr.)	40 c. (2 fr.)
Herbert G. Wylie ¹⁹	WIF	Marconi.....	300,600	4 c. (0.20 fr.)	40 c. (2 fr.)
Howick Hall ²⁰	KLT	do.....	300,600	4 c. (0.20 fr.)	40 c. (2 fr.)
Llama ²¹	KSI	do.....	300,600	4 c. (0.20 fr.)	40 c. (2 fr.)
Lyman Stewart ²²	WTL		300,600		
Maracas ²³	KMR	Marconi.....	300,600		
Motano ²⁴	KSB		300,600		
Norman Bridge ²⁵	WIG	Marconi.....	300,600	4 c. (0.20 fr.)	40 c. (2 fr.)
Olson & Mahony ²⁶	WIK	Composite, 375...	300,600	2 c. (0.10 fr.)	20 c. (1 fr.)
Princeton (KST) ²⁷	KST		300,600		
Sandy Hook ²⁸	KNJ		300,600		
Santa Clara (KIR) ²⁹	KIR		300,600		
Somerset (KSU) ³⁰	KSU		300,600		
Tarantula ³¹	KZT				
Winchester ³²	KZK				

*Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

†Radio station operated and controlled by the Golden Gate Transportation Co.

¹ J. B. Crocker, owner of vessel.

² F. D. Bourne, owner of vessel.

³ Standard Oil Co. of New Jersey, owner of vessel.

⁴ Colonial Navigation Co., owner of vessel.

⁵ Petroleum Transport Co., owner of vessel.

⁶ United States Steel Products Co., owner of vessel.

⁷ W. R. Grace & Co., owner of vessel.

⁸ Robert Graves, owner of vessel.

⁹ G. R. Hanify & Co., owner of vessel. The station has a range of 100 miles, general public service, with no regular hours.

¹⁰ Vacuum Oil Co., owner of vessel.

¹¹ Great Northern Pacific Steamship Co., owner of vessel. The station has a range of 150 miles, general public service, with continuous hours.

¹² Union Oil Co. of California, owner of vessel.

¹³ New York Transatlantic Steamship Co. (Inc.), owner of vessel.

¹⁴ Olson & Mahony, owner of vessel. The station has a range of 200 miles, general public service, with no regular hours.

¹⁵ United New York & Sandy Hook Pilot's Association, owner of vessel.

¹⁶ American & Cuban Steamship Line, owner of vessel.

¹⁷ W. K. Vanderbilt, jr., owner of vessel.

¹⁸ Irving Cox, owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Station.	Call signal.	Station.
KGI	Oakland, Cal.....c	KSU	Somerset.....b
KIR	Santa Clara.....b	KWL	Addison E. Bullard.....b
KLK	Craster Hall.....b	KZA	Alberta.....b
KLT	Howick Hall.....b	KZD	Emeline.....b
KLU	Charlton Hall.....b	KZK	Winchester.....b
KMR	Maracas.....b	KZT	Tarantula.....b
KNH	Brockton.....b	WID	Charles E. Harwood.....b
KNI	De Soto.....b	WIE	Edward L. Doheny.....b
KNJ	Sandy Hook.....b	WIF	Herbert G. Wylie.....b
KRA	Francis Hanly.....b	WIG	Norman Bridge.....b
KRK	Gargoyle.....b	WIK	Olson & Mahony.....b
KSB	Motano.....b	WIN	Colusa.....b
KSC	Cushing.....b	WIR	Great Northern.....b
KSG	Baton Rouge.....b	WIX	St. Petersburg, Fla.....c
KSI	Llama.....b	WIZ	Benton Harbor, Mich.....c
KSK	Caddo.....b	WLM	Huntington Harbor, Northport, N. Y.....c
KSP	Caloria.....b	WRG	Passagrille, Fla.....c
KSR	Bayway.....b	WTL	Lyman Stewart.....b
KST	Princeton.....b		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Montgomery, Ala.....	5ZI	300, 600, 1625, 1800.....	P	X	Wm. H. Amerine (Signal Corps, Ala. Nat. Guard).
Pacific Grove, Cal.....	6ZB	300, 500, 600.....	P	X	Howard S. Bunting.
Richmond, Va.....	3ZK	500, variable.....	P	X	Frank S. Splatt (Signal Corps, Va. Nat. Guard).
Schenectady, N. Y.....	2XA	300, 600, 1000, 1200, 1700.	P	X	E. M. Kinney.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
2XA	Second district: Schenectady, N. Y.	5ZI	Fifth district: Montgomery, Ala.
3ZK	Third district: Richmond, Va.	6ZB	Sixth district: Pacific Grove, Cal.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, and in the International List of Radiotelegraph Stations published by the Berne bureau.]

- ASTORIA, OREG.**—Rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.
- AVALON, CAL.**—W. L., 300, 527, 600.
- BALBOA, PANAMA.**—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.
- BALTIMORE, MD.**—Range, 125.
- BOSTON (WBF), MASS.**—Range, 200; system, Marconi, 218.
- BROOKLYN, N. Y.**—System, Fessenden, 250-1000; W. L., 300, 600, 1650, 1800, 2600, 3600; service, PG and PR; hours, 4m-12m, 1s-9s; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram; transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram; ships plying between New York City and points distant not more than 200 miles by water, 3 c. (0.15 fr.) per word, 30 c. (1.50 fr.), minimum, per radiogram. Strike out Note.
- BUFFALO, N. Y.**—Range, 185; system, Marconi, 50; hours, Apr. 15-June 3, 7s-12s, 1m-7m; June 3-Sept. 15, 7m-12m, 1s-6s, 7s-12s, 1m-6m; Sept. 15-Dec. 15, 7s-12s, 1m-7m.
- BURRWOOD, LA.**—Range, 400; system, composite, 500; W. L., 300, 600, 1650, 1800; service, PG and PR; hours, 7m-7.05m, 9m-9.05m, 11m-11.05m, 2s-2.05s, 4s-4.05s, 7s-7.05s; rates, PG service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram, PR service to New Orleans (WNU), La., 5 c. (0.25 fr.) per word, without minimum. Notes, Station also corresponds with a station at Cape San Antonio, Cuba, and one at New Orleans (WNU), La. The operator listens in at intermittent times on the hour and half hour.
- CALUMET, MICH.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, 8m-1s, 2s-7s, 8s-1m, 2m-7m; rates, 3 c. (0.15 fr.) per word, 30 c. (1.50 fr.), minimum, per radiogram.
- CAPE BLANCO, OREG.**—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum per radiogram.
- CAPE HATTERAS, N. C.**—Range, 200; system, Marconi, 240.
- CAPE MAY, N. J.**—System, Marconi, 240.
- CHICAGO, ILL.**—Range, 150; system, Marconi, 120.
- CLEVELAND, OHIO.**—Range, 150; system, Marconi, 120; hours, 9m-12m, 12.30s-8s, 9s-11s, 12s-8m.
- COLON, PANAMA.**—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.
- DAVAO, P. I.**—Note, Radio station operated and controlled by the Philippine insular government.
- DETROIT, MICH.**—G. loc., O 83° 07' 15'', N 42° 15' 17''; system, Marconi, 120.
- DOUGLAS, ARIZ.**—System, Marconi, 480.
- DULUTH, MINN.**—Range, 150; system, Marconi, 120; hours, 8m-12m, 1s-7s, 8s-12s, 1m-7m.
- EAST SAN PEDRO, CAL.**—System, Marconi, 235; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram, to ships *Hermosa* and *Cabrillo*, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram (address and signature free of charge), for radiotelegrams exchanged with Avalon, Catalina Island, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- EL PASO, TEX.**—Notes, The station is reserved for limited public service overland with Fort Worth, Tex., Los Angeles (KLS), and South San Francisco, Cal. The station applies special zone rates, which may be obtained upon application to the Federal Telegraph Co.
- ENSENADA, P. R.**—G. loc. (approximate), O 66° 57' 00'', N 17° 59' 00''; range, 250; system, Marconi, 240; W. L., 300, 600, 1610; service, PG and PR; hours, week days, 8m-6s, Sundays, 9m-12m; rates, to ships, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram; to San Domingo City, La Romana, and San Pedro Macoras, 12 c. (0.60 fr.) per word, without minimum.
- EUREKA (NPW), CAL.**—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

- EUREKA (KPM), CAL.**—Rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.
- FORT MILLS, P. I.**—Service, PG.
- FORT MORGAN, ALA.**—Service, PG and PR; hours, PG service, 7.10m–7.20m, 7.40m–7.50m, 8.10m–8.20m, 8.40m–8.50m, 9.10m–9.20m, 10.10m–10.20m, 10.40m–10.50m, 11.10m–11.20m, 11.40m–11.50m, 12.10s–12.20s, 2.10s–2.20s, 2.40s–2.50s, 3.10s–3.20s, 3.40s–3.50s, 4.10s–4.20s, 4.40s–4.50s, 5.10s–5.20s, 5.40s–5.50s, 6.10s–6.20s; PR service, 7.00m–7.10m, 7.30m–7.40m, 8.00m–8.10m, 8.30m–8.40m, 9.00m–9.10m, 10.00m–10.10m, 10.30m–10.40m, 11.00m–11.10m, 11.30–11.40, 12.00m–12.10s, 2.00s–2.10s, 2.30s–2.40s, 3.00s–3.10s, 3.30s–3.40s, 4.00s–4.10s, 4.30s–4.40s, 5.00s–5.10s, 5.30s–5.40s, 6.00s–6.10s; rates, to ships, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram; PR service with Mobile, Ala., 10 c. (0.50 fr.) per word, \$2 (10 fr.), minimum, per radiogram. Note, The station also corresponds with Mobile, Ala.
- FRANKFORT, MICH.**—System, Marconi, 120; service, PG; hours, 8m–12m, 1s–7s; rates, 3 c. (0.15 fr.) per word, 30 c. (1.50 fr.), minimum, per radiogram. Strike out Notes.
- FRIDAY HARBOR, WASH.**—System, Marconi, 120; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.
- GALVESTON, TEX.**—System, Marconi, 400.
- GRAND HAVEN, MICH.**—Service, PG; hours, 7m–12m, 8s–11s. Strike out Note.
- GRAND MARAIS, MINN.**—System, Marconi, 120; service, PG. Strike out Note.
- GUANTANAMO BAY, CUBA.**—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.
- HEEIA POINT, HAWAIIAN ISLANDS.**—Note, The station communicates only with south San Francisco, Cal.; minimum, per radiogram, 75 c. (3.75 fr.), special count.
- HILLCREST (DALY CITY), CAL.**—System, Marconi, 120; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.
- HOLLISTER, CAL.**—System, composite, 466. Strike out Note.
- HULL, MASS.**—G. loc., O 70° 54' 00'', N 48° 18' 22''; range, 100; system, composite, 1,000.
- JACKSONVILLE, FLA.**—G. loc., O 81° 38' 56'', N 30° 19' 25''; range, 150.
- KEY WEST, FLA.**—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.
- LOS ANGELES (KEX), CAL.**—System, Marconi, 120.
- LUDINGTON, MICH.**—System, Marconi, 120; hours, 12.30m–6m, 7.30m–11.30m, 1s–5.30s, 7.30s–11.30s, when lake is open to navigation. Strike out Notes.
- MACKINAC ISLAND, MICH.**—G. loc. (approximate), O 84° 35' 00'', N 45° 54' 00''; range, 150; system, Marconi, 120; W. L., 600; service, PG; hours, 8m–12m, 2s–5s, 8s–9s; rates, 3 c. (0.15 fr.) per word, 30 c. (1.50 fr.), minimum, per radiogram.
- MANISTIQUE, MICH.**—Range, 125; system, Marconi, 240; W. L., 300, 600; service, PG; hours, 8m–11m, 2s–5s, 7s–9s; rates, 3 c. (0.15 fr.) per word, 30 c. (1.50 fr.), minimum, per radiogram.
- MANITOWOC, WIS.**—Range, 125.
- MARSHFIELD, OREG.**—System, Marconi, 120; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.
- MIAMI, FLA.**—Range, 300; system, Marconi, 240; W. L., 300, 550, 600.
- MILWAUKEE, WIS.**—Hours, 1.30m–7m, 8m–12m, 1s–6s, 8s–12.30m. Strike out Notes.
- MOBILE, ALA.**—Service, PG and PR; hours, PG service, 7.10m–7.30m, 7.40m–8.00m, 8.10m–8.30m, 8.40m–9.00m, 10.10m–10.30m, 10.40m–11.00m, 11.10m–11.30m, 11.40m–12m, 2.10s–2.30s, 2.40s–3.00s, 3.10s–3.30s, 3.40s–4.00s, 4.10s–4.30s, 4.40s–5.00s, 5.10s–5.30s, 5.40s–6.00s; PR service, 7.00m–7.10m, 7.30m–7.40m, 8.00m–8.10m, 8.30m–8.40m, 9.00m–9.10m, 10.00m–10.10m, 10.30m–10.40m, 11.00m–11.10m, 11.30m–11.40m, 12m–12.10s, 2.00s–2.10s, 2.30s–2.40s, 3.00s–3.10s, 3.30s–3.40s, 4.00s–4.10s, 4.30s–4.40s, 5.00s–5.10s, 5.30s–5.40s, 6.00s–6.10s; rates, for service with ships, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram; PR service with Fort Morgan, Ala., 10 c. (0.50 fr.) per word, \$2 (10 fr.), minimum, per radiogram. Note, Station also corresponds with Fort Morgan, Ala.
- NEW LONDON (WLC), CONN.**—Range, 100; system, Fessenden, 120.
- NEW ORLEANS (WHK), LA.**—G. loc. (approximate), O 90° 07' 00'', N 29° 59' 00''; range, 200; system, Marconi, 400.

NEW ORLEANS (WNU), LA.—Range, 400; system, composite, 1000; W. L., 300, 600, 1800, 1850; service, PG, PR, and P; hours, N; rates, for service with ships, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram. PR service rates (charges per word, cable count, no minimum), as follows:

	Francs.	Cents.
Belize, British Honduras.....	0.875	17.5
Bluefields, Nicaragua.....	1.125	22.5
Bocas del Toro, Panama.....	1.375	27.5
Burwood, La.....	.25	5.0
Ceiba, Spanish Honduras.....	1.25	25.0
Colon, Panama.....	1.00	20.0
Port Limon, Costa Rica.....	1.25	25.0
Puerto Barrios, Guatemala.....	1.125	22.5
Puerto Cortez, Spanish Honduras.....	1.125	22.5
Santa Marta, Colombia.....	1.875	37.5
Swan Island.....	.625	12.5
Tela, Spanish Honduras.....	1.125	22.5
Truxillo, Spanish Honduras.....	1.125	22.5

NEWPORT (WCI), R. I.—System, Fessenden, 260.

NEWTON, MASS.—System, Clapp-Eastham, 2000; service, P.

NEW YORK (WHB).—System, Wireless Specialty Apparatus Co., 1000; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.

NEW YORK (WNT).—Range, 150; system, Telefunken, 1000; hours, 9m–5a, except Sundays and holidays.

NORTH HEAD, WASH.—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

PHILADELPHIA (WHE), PA.—System, Marconi-United, 240; W. L., 300, 600, 1650; hours, 8m–12s.

POINT ARGUELLO, CAL.—Rates 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

PORT ARTHUR, TEX.—G. loc., O 93° 55' 35", N 29° 52' 46"; system, Marconi, 400.

SAN DIEGO (NPL), CAL.—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

SAN JUAN, P. R.—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

SAN LUIS OBISPO, CAL.—G. loc. (approximate), O 120° 45' 00", N 35° 10' 00"; range, 150; system, Marconi, 240; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.

SAVANNAH, GA.—Range, 200; system, Marconi-United, 240; W. L., 300, 500, 600.

SAYVILLE, N. Y.—Strike out all particulars regarding limited public-service station.

SAYVILLE, N. Y. (PG station).—Hours, 2m–2s.

SEATTLE, WASH.—Range, 200; system, Marconi, 120; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.

SLASCONSET, MASS.—System, Marconi, 480.

SOUTH SAN FRANCISCO, CAL.—Note, Station reserved for correspondence with El Paso, Tex., and Heeia Point (near Honolulu), Hawaiian Islands. Rates, 75 c. (3.75 fr.) per radiogram, special count.

SOUTH WELFLEET, MASS.—System, Marconi, 120–233; W. L., 300, 600, 2100; rates, North and South American service, 6 c. (0.30 fr.), per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram, distances exceeding 400 miles, 42 c. (2.10 fr.) per word, \$4.20 (21 fr.), minimum, per radiogram.

TAMPA, FLA.—System, Marconi, 400.

TATOOSH, WASH.—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

TUTUILA, SAMOA.—Rates, 5 c. (0.25 fr.) per word, 50 c. (2.50 fr.), minimum, per radiogram.

VIRGINIA BEACH, VA.—System, Marconi, 240; W. L., 300, 550, 600.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made in the list of Radio Stations of the United States, and in the International List of Radiotelegraph Stations published by the Berne bureau.]

- ABANGAREZ.**—Range, 500; system, Wireless Specialty Apparatus Co., 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ADELINE SMITH.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- ADMIRAL DEWEY.**—System, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram; hours, N.
- ADMIRAL EVANS.**—System, Marconi; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ADMIRAL FARRAGUT.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- ADMIRAL SAMPSON.**—Strike out all particulars.
- ADMIRAL SCHLEY.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ADMIRAL WATSON.**—Range, 150; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ADVANCE.**—Range, 300; system, Telefunken, 1000.
- A. G. LINDSAY.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- ALABAMA (KSX).**—Strike out all particulars.
- ALABAMA (KUN).**—Range, 200; system, Marconi, 240; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- ALABAMA (WFB).**—Range, 150; system, Marconi, 120.
- ALAMEDA.**—Range, 200; system, Marconi, 120; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- ALAMO.**—System, Marconi, 400.
- ALASKAN.**—Range, 200; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ALBATROSS.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- ALGONQUIN (KVG).**—System, Marconi, 120.
- AL-KI.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Note, Northland Steamship Co., owner of vessel.
- ALLIANÇA.**—Range, 300; system, Telefunken, 1000; W. L., 300, 450, 600. Note, Radio station operated and controlled by the Atlantic Communication Co.
- ALLIANCE.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- AMERICAN.**—Range, 200; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ANCON.**—Range, 300; system, Telefunken, 1000; W. L., 300, 400, 500, 600.
- ANN ARBOR, No. 3.**—Range, 125; system, Marconi, 120; hours, N.
- ANN ARBOR, No. 4.**—Range, 125; system, Marconi, 120; hours, N.
- ANN ARBOR, No. 5.**—Range, 125; system, Marconi, 120; hours, N.
- ANTILLES.**—System, Marconi, 120.
- APACHE (KVÁ).**—System, Marconi, 250.
- ARAPAOE.**—System, Marconi, 400.
- ARGYLL (WTB).**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

- ARIZONA.**—Range, 150; system, Marconi, 120; hours, X.
- ARIZONAN.**—Range, 350; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- AROLINE.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ASHTABULA.**—Range, 125; system, Marconi, 240.
- ASTRAL.**—Note, Standard Oil Co. of New York, owner of vessel.
- ASUNCION (WTK).**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- ATENAS.**—Range, 500; system, composite, 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ATLANTIC.**—Range, 200; system, Marconi, 240; hours, X.
- ATLAS (WTT).**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Note, Standard Oil Co. of California, owner of vessel.
- AZTEC.**—System, Marconi, 240; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- BAY STATE.**—Range, 300.
- BEAR (WWD).**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- BEAVER (WWB).**—Range, 200; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- BELFAST.**—Range, 200; system, Marconi, 120.
- BERKSHIRE.**—System, Marconi-United, 240.
- BERLIN (WRB).**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- BORINQUEN.**—Strike out system. Strike out notes.
- BRAZOS.**—System, Marconi, 240.
- BREAKWATER.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- BRILLIANT (KTI).**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.
- BRINDILLA.**—Note, Standard Oil Co. of New Jersey, owner of vessel.
- BRUNSWICK.**—System, Marconi, 240.
- BUFFALO (NBU).**—Call, NCU.
- CABRILLO.**—Range, 150; system, Marconi, 120; hours, X; rates, San Pedro-Avalon ferry service, 1 c. (0.05 fr.) per word, 10 c. (0.50 fr.), minimum, per radiogram.
- CALIFORNIA (KYQ).**—Note, Mrs. Clara B. Stocker, owner of vessel (yacht).
- CALVIN AUSTIN.**—Range, 200; system, Marconi, 120.
- CAMDEN.**—Range, 200; system, Marconi, 120.
- CAMINO.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- CAPTAIN A. F. LUCAS.**—Range, 200; system, Marconi, 120; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- CARACAS.**—System, Marconi, 120.
- CARLOS.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- CAROLINA (WFE).**—Range, 150; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- CARTAGO.**—Range, 500; system, Wireless Specialty Apparatus Co., 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

CATANIA.—Strike out all particulars.

CELLO.—System, Marconi, 120; service, PG; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

CENTRALIA.—System, Marconi, 120; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

CHALMETTE.—System, Marconi, 400.

CHEROKEE.—System, Marconi, 400.

CHICAGO (WAC).—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

CHICAGO (WFI).—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

CHINA (WWA).—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

CHRISTOPHER COLUMBUS.—Range, 150; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.

COAMO.—System, Marconi, 400.

COL. E. L. DRAKE.—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.

COL. JAMES M. SCHOONMAKER.—Range, 150; system, Marconi, 120.

COLON.—System, Telefunken, 1000; W. L., 300, 450, 600.

COLUMBIA (KYM).—System, Telefunken, 1000.

COLUMBIA (WHC).—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

COLUMBIAN (WKS).—Range, 200; system, Telefunken, 1000; hours, 9m-12m, 2a-5a, 8a-10.30a, rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

COMAL.—System, Marconi, 400.

COMANCHE.—System, Marconi, 400.

COMET (KTJ).—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.

COMUS (KKD).—System, Marconi, 120.

CONCHO.—System, Marconi, 120.

CONGRESS.—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

COPPENAME.—Range, 350; system, Wireless Specialty Apparatus Co., 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

CORDOVA.—System, Marconi, 120; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.

CORONADO.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Coronado Co., owner of vessel.

CREOLE.—System, Marconi, 400.

CRETAN.—System, Marconi-United, 120.

CRISTOBAL.—Range, 300; system, Telefunken, 1000; W. L., 300, 450, 600.

CYPRUS.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Daniel C. Jackling, owner of vessel (yacht).

CITY OF ALPENA II.—Range, 125; system, Marconi, 120; hours, X.

CITY OF ANNAPOLIS.—Strike out all particulars.

CITY OF AUGUSTA.—System, Marconi, 120.

CITY OF BALTIMORE.—Strike out all particulars.

CITY OF BANGOR.—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Eastern Steamship Corporation, owner of vessel.

- CITY OF BENTON HARBOR.**—Range, 150; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- CITY OF BUFFALO.**—Range, 100; system, Marconi, 120.
- CITY OF CHICAGO.**—Range, 125; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- CITY OF CLEVELAND III.**—Range, 125; system, Marconi, 240. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Detroit & Cleveland Navigation Co., owner of vessel.
- CITY OF COLUMBUS.**—System, Marconi, 240.
- CITY OF DETROIT II.**—Range, 125; system, Marconi-United, 120.
- CITY OF DETROIT III.**—Range, 125; system, Marconi, 120.
- CITY OF ERIE.**—System, Marconi, 240; hours, X.
- CITY OF EVERETT.**—Note, Standard Oil Co. of New York, owner of vessel.
- CITY OF GRAND RAPIDS.**—Range, 125; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- CITY OF MACKINAC II.**—Range, 125; system, Marconi, 120; hours, X.
- CITY OF MONTGOMERY.**—System, Marconi, 120.
- CITY OF NORFOLK.**—Strike out all particulars.
- CITY OF PARA.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- CITY OF PUEBLA.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- CITY OF RICHMOND.**—Strike out all particulars.
- CITY OF ROCKLAND.**—Range, 200; system, Marconi, 120.
- CITY OF ST. IGNACE.**—Range, 125; system, Marconi, 120; hours, X.
- CITY OF ST. LOUIS.**—System, Marconi, 400.
- CITY OF SAVANNAH.**—System, Marconi, 400.
- CITY OF SEATTLE.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- CITY OF SYDNEY.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- CITY OF TOPEKA.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- DAKOTAN.**—System, Marconi, 480.
- DAMARA.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Edgar F. Luckenbach, owner of vessel.
- DELAWARE SUN.**—Range, 250; system, Marconi, 120; hours, 8m-12m; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- DELEI.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- DENVER (KED).**—System, Marconi, 120.
- DOLPHIN (WAU).**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- DORA.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Alaska Steamship Co., owner of vessel.
- DORCHESTER.**—Range, 200; system, Marconi-United, 120.
- DOROTHY BRADFORD.**—Range, 200.
- EASTERN STATES.**—Range, 125; system, Marconi, 240.
- EASTLAND.**—Range, 100; system, Marconi-United, 120.
- EDGAR H. VANCE.**—Range, 150; system, Marconi, 1000; W. L., 300, 600; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Hammond Lumber Co., owner of vessel.
- EL ALBA.**—System, Marconi, 480; hours, N.
- EL CID.**—System, Marconi, 120.
- EL DIA.**—System, Marconi, 120; hours, X.
- EL MUNDO.**—System, Marconi, 120.
- EL OCCIDENTE.**—System, Marconi, 400.
- EL ORIENTE.**—System, Marconi, 400.
- EL RIO.**—System, Marconi, 400.

- EL SEGUNDO.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- EL SIGLO.**—System, Marconi, 120.
- EL SOL.**—System, Marconi, 400.
- EL SUD.**—System, Marconi, 1000.
- ENTERPRISE.**—System, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- Eocene.**—Note, Radio station operated and controlled by the Standard Oil Co. of New York, owner of vessel.
- ERSKINE M. PHELPS.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. William D. Sewall (Union Oil Co.), owner of vessel.
- ESPERANZA.**—System, Marconi, 120.
- ESSEX (KQE).**—System, Marconi-United, 120.
- EXCELSIOR (KKO).**—System, Marconi, 400.
- F. A. KILBURN.**—Range, 150; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- FALCON (WRK).**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- FAVORITE.**—Range, 100; system, Marconi, 120; hours, X; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- FIFIELD.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- FLORIDA (KSY).**—Strike out all particulars.
- FLORIDA (KUS).**—Range, 150; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- FRANK H. BUCK.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Associated Oil Co., owner of vessel.
- FRIEDA.**—System, Marconi, 480; hours, X.
- GENERAL HUBBARD.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Hubbard Steamship Co., owner of vessel.
- GENL. PETTIBONE.**—Note, Guyton & Co., owner of vessel.
- GEO. W. ELDER.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. North Pacific Steamship Co., owner of vessel.
- GEORGE W. FENWICK.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Fenwick Steamship Co. (California & Atlantic Steamship Co.), owner of vessel.
- GEORGIAN (WKG).**—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- GLORY OF THE SEAS.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Glacier Fisheries Co., owner of vessel.
- GLOUCESTER (KQG).**—System, Marconi-United, 120.
- GOVERNOR.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- GOVERNOR COBB.**—Range, 200; system, Marconi, 120.
- GOVERNOR DINGLEY.**—Range, 200; system, Marconi, 120; hours, N; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- GRACE DOLLAR.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

- GRECIAN.**—Range, 150; system, Marconi, 240.
- GUARDIAN.**—Range, 200; system, Marconi, 240; hours, N; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- GULFOIL.**—Range, 200; system, Marconi, 240; hours, various from 6m-9s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- GULFSTREAM.**—Range, 250; system, Marconi, 240; hours, 8m-12m; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- HAMILTON.**—System, Marconi, 140.
- HANALET.**—Strike out all particulars.
- HARVARD.**—System, Poulsen arc. Strike out Rates. Notes, Radio station operated and controlled by the Federal Telegraph Co. Metropolitan Steamship Co. (Pacific Steam Navigation Co.), owner of vessel.
- HAYANA.**—System, Marconi, 120.
- HENRY M. FLAGLER.**—Range, 100; system, Marconi, 240; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Florida East Coast Railway Co., owner of vessel.
- HENRY T. SCOTT.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. California Steamship Co., owner of vessel.
- HEREDIA.**—Range, 500; system, composite, 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- HILONIAN.**—Range, 200; system, Marconi, 120; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- HOLLAND (WDW).**—Range, 150; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- HONOLULU.**—Range, 250; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- HOWARD.**—System, Marconi-United, 120.
- HUMBOLDT.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- HURON.**—System, Marconi, 400.
- HYADES.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Matson Navigation Co., owner of vessel.
- IAQUA.**—System, Marconi, 230; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ILLINOIS (WCZ).**—Range, 150; system, Marconi, 120.
- INDEPENDENT.**—System, Marconi; W. L., 300, 600; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Weiding & Independent Fisheries Co., owner of vessel.
- INDIAN (KQI).**—Range, 150; system, Marconi-United, 120.
- INDIANA (WFC).**—Range, 150; system, Marconi, 120.
- IOWA (WFD).**—Range, 150; system, Marconi, 120.
- IOWAN.**—Range, 250; system, Telefunken, 1000.
- IROQUOIS (KVF).**—Range, 200; system, Marconi, 400; W. L., 300, 600; service, PG; hours, N; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Clyde Steamship Co., owner of vessel.
- ISTHMIAN.**—Range, 200; system, Telefunken, 1000; hours, 9m-12m, 2s-6s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- J. A. CHANSLOR.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Associated Oil Co., owner of vessel.
- JAMESTOWN.**—System, Marconi, 120.
- J. B. STETSON.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- JEFFERSON (KOD).**—System, Marconi, 120.

- JEFFERSON (WAJ).—System, Marconi, 120; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- J. M. GUFFEY.—Range, 200; system, Marconi, 120; hours, various from 6m–9s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- JOHN A. HOOPER.—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- JOHN D. ARCHBOLD.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.
- JOHN D. ROCKEFELLER.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New Jersey, owner of vessel.
- JUNIATA (KQJ).—System, Marconi-United, 120.
- KERSHAW.—System, Marconi-United, 120.
- KLAMATH.—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- KOREA.—Range, 250; system, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- LAKEPORT.—Range, 100; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, 2 c. (10 fr.), per word, 20 c. (1 fr.), minimum, per radiogram.
- LAMPASAS.—System, Marconi, 120.
- LANSING.—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- LARIMER.—Range, 200; system, Marconi, 120; hours, various from 6m–9s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- LATOCHE.—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- LEELANAW.—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- LEWIS LUCKENBACH.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Edgar F. Luckenbach (California & Atlantic Steamship Co.), owner of vessel.
- LEXINGTON (KNB).—System, Fessenden, 260.
- LEXINGTON (KQL).—Range, 150; system, Marconi-United, 240.
- LOUISE.—Range, 75; system, Marconi-United, 120; W. L., 300, 600; service, PG; hours, 9m–11s. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Tolchester Beach Improvement Co., owner of vessel.
- LOUISIANA (KUL).—Range, 200; system, Marconi, 240; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- LURLINE.—Range, 200; system, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- LYRA (WNF).—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MACKINAW.—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MADISON.—System, Marconi, 120.
- MANCHURIA.—Range, 250; system, Marconi, 240; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MANITOU (WFW).—Range, 150; system, Marconi, 120.
- MANOA.—Range, 200; system, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MARACAIBO.—System, Marconi, 120.
- MARIPOSA.—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.

- MAROWLINE.**—Range, 350; system, Wireless Specialty Apparatus Co., 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MARQUETTE & BESSEMER No. 1.**—Range, 125; system, Marconi, 240.
- MARQUETTE & BESSEMER No. 2.**—Range, 125; system, Marconi, 240; hours, X.
- MASSACHUSETTS (KJM).**—Range, 200; system, Marconi, 120; hours, N; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Eastern Steamship Corporation, owner of vessel.
- MATSONIA.**—Range, 200; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MAVERICK.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- MERRIMACK.**—System, Marconi-United, 120.
- MEXICAN.**—Range, 350; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MEXICO (KWV).**—System, Marconi, 400.
- MILLINOCKET.**—System, Marconi, 120. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. A. H. Bull Steamship Co., owner of vessel.
- MINNESOTA (WEK).**—Range, 150; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Lake Michigan Steamship Co., owner of vessel.
- MINNESOTA (WMI).**—Rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- MINNESOTAN.**—System, Marconi, 1000.
- MISSOURI (WFX).**—Range, 125; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- MOHAWK (KVM).**—System, Marconi, 400.
- MOHAWK (NRM).**—Call in United States list should be NRM instead of NVM.
- MOHEGAN.**—System, Fessenden, 250.
- MOMUS.**—System, Marconi, 120.
- MONGOLIA.**—Range, 250; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MONTEREY (KWY).**—System, Marconi, 400.
- MORRO CASTLE.**—System, Marconi, 120.
- MULTNOMAH.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Multnomah Steamship Co., owner of vessel.
- NACOCHEE.**—System, Marconi, 120.
- NANN SMITH.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- NANTUCKET.**—System, Marconi-United, 120.
- NAVAJO (WNJ).**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Western Steam Navigation Co. (California & Atlantic Steamship Co.), owner of vessel.
- NEBRASKA.**—System, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s.
- NELSON.**—Range, 200; system, Marconi, 480.
- NEMO.**—Range, 20; system, Wireless Improvement Co., 1000; hours, X. Notes, Radio station operated and controlled by Emil J. Simon. M. N. Liebmann, owner of vessel.
- NEVADAN.**—Range, 200; system, Telefunken, 1000; hours, 9m-12 m, 2s-5s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- NEWPORT (WWH).**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- NOME CITY.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.

- NORTH AMERICAN.**—Range, 150; system, Marconi, 480.
- NORTHLAND (WNX).**—System, Marconi, rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. E. J. Dodge & Co., owner of vessel.
- NORTH LAND (WCN).**—System, Marconi, 120.
- NORTH LAND (KJD).**—System, Marconi, 120.
- NORTH STAR (KJS).**—System, Marconi, 120.
- NORTHWESTERN.**—System, Marconi, 120.
- NORTH WIND.**—System, Telefunken, 120.
- NORWOOD.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- NUCES.**—System, Marconi, 120.
- NEW HAVEN (KXN).**—System, Fessenden, 260.
- NEW JERSEY (KNJ).**—Strike out all particulars.
- OCEANA.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Bermuda-American Steamship Co., owner of vessel.
- OCTORARA.**—System, Marconi, 120.
- OLEUM.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Fillmore Condit (Union Oil Co.), owner of vessel.
- OLIVER J. OLSON.**—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- OLIVETTE.**—Range, 200; system, Marconi, 400.
- ONEONTA.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Port of Portland, owner of vessel.
- ONTARIO.**—System, Marconi-United, 120.
- PAMPANGA.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- PANAMA (KMH).**—Range, 300; system, Telefunken, 1000; W. L., 300, 450, 600.
- PAN-AMERICAN.**—Range, 150; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Texas Steamship Co., owner of vessel.
- PARAGUAY.**—Range, 150; system, Marconi-United, 120; W. L., 300, 600; service, PG.
- PARAISO.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- PARISMINA.**—Range, 500; system, composite, 1000; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Parismina Steamship Corporation, owner of vessel.
- PARTHIAN.**—Range, 150; system, Marconi-United, 120.
- PENNSYLVANIA (WWJ).**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- PERE MARQUETTE.**—Range, 100; system, Marconi, 120; hours, N.
- PERE MARQUETTE 17.**—System, Marconi, 120; hours, N.
- PERE MARQUETTE 18.**—Range, 125; system, Marconi, 120.
- PERE MARQUETTE 19.**—System, Marconi, 120; hours, N.
- PERE MARQUETTE 20.**—Range, 125; system, Marconi, 120; W. L., 300, 600.
- PERFECTION.**—System, Marconi; W. L., 300, 600; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Standard Oil Co. of New York, owner of vessel.
- PERSIAN.**—System, Marconi-United, 120.
- PERU (WWJ).**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- PHILADELPHIA (KDA).**—System, Marconi, 400.
- PHILADELPHIA (KSM).**—Range, 200; system, Marconi, 240.
- PLEIADES.**—Range, 200; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- PLYMOUTH.**—System, Fessenden, 260.
- PONCE.**—System, Marconi, 400.
- PORTLAND.**—Range, 200; system, Marconi, 240; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

- POWHTAN (KQY).**—System, Marconi-United, 120.
- PRESIDENT.**—Range, 200; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- PRINCESS ANNE.**—System, Marconi, 120.
- PROTEUS (KKP).**—System, Marconi, 120.
- PROTEUS (NNG).**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- PROVIDENCE.**—System, Fessenden, 260.
- PURITAN (WDU).**—Range, 150; system, Marconi, 120.
- QUEEN (WGX).**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- RADIANT.**—System, Marconi; strike out service and hours; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.
- RAYO.**—Note, Standard Oil Co. of New York, owner of vessel.
- REBONDO.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- RELAY.**—Range, 200; system, Marconi, 240; service, P; hours, N.
- RELIEF LIGHTSHIP 66 OR 85.**—Service, PG; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- RELIEF LIGHTSHIP 71 OR 72.**—Service, PG; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- RELIEF LIGHTSHIP 94 OR 53.**—Service, PG; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- REUCE.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Columbia River Packers' Association, owner of vessel.
- RICHMOND.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- RIO GRANDE (KEG).**—System, Marconi, 400.
- ROANOKE.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ROMA (WTE).**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Union Steamship Co. (Union Oil Co.), owner of vessel.
- ROSE CITY.**—Range, 200; system Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SABINE.**—System, Marconi, 400.
- SANTA JACINTO.**—System, Marconi, 460.
- SAN JOSE.**—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.), minimum, per radiogram.
- SAN JUAN (KGJ).**—System, Marconi, 120.
- SAN JUAN (WWM).**—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SAN MARCOS.**—System, Marconi, 120.
- SAN RAMON.**—System, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SANTA ANA.**—Rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Alaska Steamship Co., owner of vessel.
- SANTA CATALINA.**—Strike out all particulars.
- SANTA CECILIA.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- SANTA CLARA (WBA).**—Range, 200; system, Marconi, 240; hours, N; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- SANTA CLARA (WRS).**—System, Marconi, 120; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.

- SANTA CRUZ (WBD).**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Atlantic & Pacific Steamship Co., owner of vessel.
- SANTA MARIA (WTF).**—Range, 200; system, Marconi, 120; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SANTA RITA (WTG).**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. United Steamship Co. (Union Oil Co.), owner of vessel.
- SANTANTA.**—Range, 30; system, Clapp-Eastham, 900; service, P; hours, X.
- SARATOGA (KWS).**—System, Marconi, 120.
- SATELLITE (KPS).**—Range, 30; system, composite, 120; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by Alfred S. Sorenson & Sons, owners of vessel.
- SEEBANDBEE.**—Range, 150; system, Marconi, 120.
- SEGURANCA.**—System, Marconi, 400. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.
- SEMINOLE (KVJ).**—System, Marconi, 120.
- SENATOR.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- SENATOR BAILEY.**—Strike out all particulars.
- SEWARD.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Alaska Steamship Co., owner of vessel.
- SHENANGO (KTC).**—Range, 150; system, Marconi, 120; hours, various from 6m–9s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- SHENANGO (WET).**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- SIBERIA.**—Range, 250; system, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SIERRA.**—Strike out range, system, and rates. Note, Oceanic Steamship Co., owner of vessel.
- SOCONY.**—Note, Standard Oil Co. of New York, owner of vessel.
- SOMERSET (KQS).**—System, Marconi-United, 120.
- SONOMA (WHM).**—Range, 250; system, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SOUTH AMERICAN (KVW).**—Range, 150; system, Marconi, 240; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- SOUTH AMERICAN (WEO).**—Range, 125; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- SPEEDWELL.**—Range, 100; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SPOKANE.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- S. O. Co. No. 91.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- S. O. Co. No. 92.**—Note, Standard Oil Co. of New York, owner of vessel.
- S. O. Co. No. 93.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- S. O. Co. No. 94.**—Note, Standard Oil Co. of New York, owner of vessel.
- S. O. Co. No. 95.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- STANLEY DOLLAR.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Dollar Steamship Line, owners of vessel.

- STARR.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. San Juan Fishing & Packing Co., owner of vessel.
- STATE OF OHIO.**—Range, 100; system, Marconi-United, 120. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Cleveland & Buffalo Transit Co., owner of vessel.
- SUN.**—Range, 250; system, Marconi, 240; hours, 8m-12m.
- SUWANNEE.**—System, Marconi-United, 120.
- ST. FRANCIS.**—System, Marconi; rates 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Libby, McNeill & Libby, owners of vessel.
- ST. HELENS.**—Rates, North and South American service 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ST. NICHOLAS.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Columbia River Packers' Association, owner of vessel.
- TAHOMA.**—Strike out all particulars.
- TASCO.**—System, Fessenden, 250; service, PG; hours, X; rates, 3 c. (0.15 fr.) per word, 30 c. (1.50 fr.), minimum, per radiogram.
- TEXAS (KUR).**—Range, 200; system, Marconi, 240; hours, X; rates 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- THEODORE ROOSEVELT.**—Range, 150; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- TIONESTA.**—System, Marconi, 120.
- TIVIVES.**—Range, 500; system, composite, 1000; hours, N; service PG; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- TOLEDO.**—Range, 200; system, Marconi, 120; W. L., 300, 600; service, PG; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Sun Co., owner of vessel.
- TOPILA.**—Hours, 7m-12m, 1s-5s, 7s-10s.
- TURRIALBA.**—Range, 500; system, Wireless Specialty Apparatus Co., 1000; service, PG; hours, N. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Turrialba Steamship Corporation, owner of vessel.
- TUSCAN.**—Range, 150; system, Marconi-United, 120; hours, 8m-8s.
- UMATILLA.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- VANADIS.**—Range, 300; system, Telefunken, 1000; W. L., 300, 450, 600; service, P; hours, X. Note, Radio station operated and controlled by C. K. G. Billings, owner of vessel (yacht).
- VENTURA.**—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- VESTA (KTS).**—System, Marconi; W. L., 300, 600; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.
- VESTAL.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- VICTORIA (WAD).**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- VIGILANCIA.**—System, Marconi, 400.
- VIRGINIA (KSZ).**—Strike out all particulars.
- VIRGINIAN (WKV).**—Range, 350; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- WALLULA.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Port of Portland, owner of vessel.
- WASHINGTONIAN.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. American-Hawaiian Steamship Co., owner of vessel.
- WASHTENAW.**—Range, 200; system, Marconi, 120; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

RADIO SERVICE BULLETIN.

- W. B. FLINT.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Libby, McNeill & Libby, owners of vessel.
- WESTERN STATES.**—Range, 125; system, Marconi, 240; hours, X.
- WHITTIER.**—Range, 200; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- WILHELMINA.**—Range, 250; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- WILLAMETTE.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Willamette Steamship Co., owner of vessel.
- WILLIAM CHATHAM.**—System, Marconi, 120; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- WM. F. HERRIN.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- WILLIAM P. SNYDER JR.**—Range, 125; system, Marconi, 120.
- WINDBER.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Pacific-American Fisheries, owner of vessel.
- WINIFRED.**—Range, 200; system, Marconi, 120; hours, 7m-9s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- W. S. PORTER.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Associated Oil Co., owner of vessel.
- YAGUEZ.**—Strike out range and system. Note, Ocean Freight Line (Inc.), owner of vessel.
- YALE.**—System, Poulsen arc. Strike out rates. Notes, Radio station operated and controlled by the Federal Telegraph Co. Metropolitan Steamship Co. (Pacific Steam Navigation Co.), owner of vessel.
- YOSEMITE.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- YUCATAN.**—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ZACAPA.**—Range, 500; system, composite, 1000; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Zacapa Steamship Corporation, owner of vessel.
- ZAPORA.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. International Fisheries Co., owner of vessel.
- ZULIA.**—System, Marconi, 240.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out particulars after the following call signals: KGS, KNJ, KRY, KRZ, KSV, KSW, KSX, KSY, KSZ, NRK, WAS, WBC, WHN, WTI.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made in the list of Radio Stations of the United States only.]

- GRAND FORKS, N. DAK.**—Call, 9XN; W. L., 300-1400*.
- HYATTSVILLE, MD.**—W. L., 300, 400, 600*.
- NEW BEDFORD, MASS.**—W. L., 200, 300, 425, 600.
- OAKLAND, CAL.**—Strike out all particulars.
- PHILADELPHIA, PA.**—W. L., 300, 500, 600.
- ST. DAVIDS, PA.**—W. L., 300, 425, 450, 600.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out 6YE, and change 9YN to 9XN.

MISCELLANEOUS.

SOUTH WELLFLEET STATION.

The license issued to the Marconi Wireless Telegraph Co. of America for their high-powered station at South Wellfleet, Mass., has been amended, authorizing a coast-station rate of 42 cents per word on radiograms transmitted to vessels at sea, distant 400 miles or more. This rate, plus an 8-cent ship-station charge, makes a total wireless rate of 50 cents per word, to which the land line charges must be added.

CLASSIFICATION OF SHIP STATIONS.

There seems to be some misunderstanding concerning the classification of ship stations, as provided in the Laws and Regulations, edition of July 27, 1914, page 51.

If a vessel volunteers to enter a class higher than required by the regulations, and is so licensed, the vessel is required to maintain the service or watch prescribed. The license is a guaranty to the public for the class of service designated therein. Vessels violating classification requirements indicated by their licenses may be penalized under section 1 of the act of August 13, 1912, as any station operating in violation of the provisions of its license is held to be operating for a purpose other than that for which it was licensed.

If a vessel of the first class finds it impossible at any time to obtain two first-grade operators, it would constitute a violation for a second-grade operator to serve, but any mitigating circumstances may be presented to the Secretary of Commerce.

The London convention provides that ship-service messages or messages of the crew may be transmitted by a second-grade operator, but contemplates that all regular paid passenger traffic be handled by first-grade operators at not less than 20 words per minute.

GASOLINE ENGINES.

Attention is invited to the act of Congress, approved October 22, 1914, effective on and after date of approval, amending section 4472, Revised Statutes, and which reads as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section forty-four hundred and seventy-two of the Revised Statutes of the United States of America be, and the same is hereby, amended by adding thereto the following provision:

"Provided, however, That nothing in the foregoing or following section of this Act shall prohibit the transportation and use by vessels carrying passengers or freight for hire of gasoline or any of the products of petroleum for the operation of engines to supply an auxiliary lighting and wireless system independent of the vessel's main power plant: *Provided further,* That the transportation or use of such gasoline or any of the products of petroleum shall be under such regulations as shall be prescribed by the board of supervising inspectors, with the approval of the Secretary of Commerce."

In the near future regulations authorized by the last proviso of the amendment will be adopted by an executive committee of the Board of Supervising Inspectors of Steam Vessels. When these regulations are approved they will be published in this bulletin as an amendment to the Radio Laws and Regulations, edition of July 27, 1914, page 49, paragraph 8.

If an internal-combustion engine is provided as the only means of auxiliary power supply to operate the radio equipment, under the act of June 24, 1910, amended July 23, 1912, it will be necessary for radio inspectors to determine if the equipment is efficient under the ship act, and in accordance with the regulations governing radio communication, page 49, paragraphs 1 to 5, inclusive.

Until such regulations are approved, gasoline may not be carried except with the approval of the Secretary of Commerce in each case, and then subject to change to meet such requirements as may be later promulgated.

INTERFERENCE.

The twelfth and thirteenth regulations, section 4, of the radio act, approved August 13, 1912, provide for a division of time between Government and commercial radio stations when interference between such stations can not be eliminated by the enforcement of the wave length and sharp tuning regulations.

In some localities where two or more commercial land stations are operated in close proximity, the various owners have mutually agreed upon a division of time.

In particular, complaints have been entered against the Federal Telegraph Co. for interference on general public service and Government wave lengths, caused by their Poulsen arc stations at San Francisco and Honolulu.

F. A. Kolster, radio expert of the Bureau of Standards, was sent to San Francisco to determine the cause of the interference and remedy it if possible. The details of his investigations will be published in an early edition of the Proceedings of the Institute of Radio Engineers. The conclusions reached by Mr. Kolster indicate that the interference caused by the arc stations is due to certain reinforced harmonics, which, in extreme cases, can be eliminated or reduced by the employment of special circuits at either the sending or receiving stations, or both. It appears, however, in the particular cases reported and investigated, that the interference can be sufficiently reduced or eliminated at the receiving station by proper manipulation of modern efficient receiving apparatus.

Operators should bear in mind the following:

First. Interference of this character can be reduced and often entirely eliminated by proper adjustment of the coupling of the receiving transformer. In most cases a fairly "loose coupling" will be required.

Second. Variation of coupling destroys resonance and thereby reduces the strength of the desired incoming signals unless the circuits are readjusted to resonance for each variation of coupling.

COMMERCIAL EXTRA FIRST-GRADE OPERATORS.

As a reward for long and efficient service, the Secretary of Commerce has issued commercial extra first-grade licenses to the following operators:

E. N. Pickerill, New York, N. Y.
H. Sadenwater, New York, N. Y.
R. R. Carlisle, San Francisco, Cal.
D. I. Moir, Seattle, Wash.
H. B. Herty, New Orleans, La.
E. M. Cadwell, New York, N. Y.
S. E. Miller, San Francisco, Cal.

C. A. Scott, Boston, Mass.
J. A. Worrall, New York, N. Y.
E. K. Oxner, Boston, Mass.
J. W. Swanson, New York, N. Y.
A. E. Gerhard, San Francisco, Cal.
G. A. Geare, Washington, D. C.

RADIO SERVICE PERSONNEL.

R. E. Thompson, radio inspector at Seattle, resigned January 1, 1915, and R. H. Marriott, one of the radio inspectors at New York, has been transferred to Seattle.

W. O. Hensgen, one of the radio inspectors at New York, resigned January 1, 1915, and C. C. Kolster, assistant radio inspector, has been detailed to New York.

PANAMA-PACIFIC INTERNATIONAL EXPOSITION.

The Bureau of Standards and the Bureau of Navigation will have a joint radio exhibit at the Panama-Pacific International Exposition. The exhibit will be located in the Liberal Arts Building.

The one-quarter kilowatt, quenched spark gap, battery operated panel set, designed by the Bureau of Standards, which did such good work on the Department's motor boat *Tarragon* last summer on the Atlantic coast, will be exhibited and demonstrated. A complete set of inspection instruments used by the radio inspectors in the enforcement of the wireless laws will be included in the exhibit and the method of inspection will be explained and demonstrated frequently. Several other features of interest to those concerned with radiotelegraphy will be exhibited and demonstrated by the Bureau of Standards.

Benjamin E. Wolf, radio inspector of the Bureau of Navigation, has been appointed special agent in charge of the Bureau of Navigation exhibit. A radio inspector will be in constant attendance and will be prepared to give information concerning the radio laws and regulations to owners and masters of vessels, operators, and amateurs. Examinations of operators for Government licenses will be conducted at the exhibit by appointment.

OPERATOR EXAMINATIONS.

The Army Service School at Fort Leavenworth, Kans., has been added to the list of places where operators may take examination for licenses.

RADIO RATES INCREASED.

The Marconi Wireless Telegraph Co. of America has been authorized to increase the Pacific coast radio rates of their ship and shore stations for the North and South American service, as follows: Ship rate from 2 cents to 4 cents per word; coastal rate from 3 cents to 6 cents per word.

This makes uniform rates for this Marconi service on both the Atlantic and Pacific coasts, and conforms to the rates of the United States Naval Radio Service.

AMATEUR FINED.

A. W. Eaton, of Los Angeles, Cal., who operated his amateur station without a license, was reported by the radio inspector of that district, and was found guilty and fined on November 24, 1914, by Judge Wellborn, of the United States district court.

This case is interesting because the defendant contended that his station did not require a license, inasmuch as he could not interfere with commercial stations in the vicinity or transmit beyond the limits of the State in which his station was located. His conviction was obtained on the ground that he could interfere with the interception of signals from outside that State by licensed amateurs, and establishes a precedent in this regard.

AMENDMENTS.

[To be cut out and pasted in your copy.]

The Radio Communication Laws of the United States, edition of July 27, 1914, are hereby amended as follows:

Paragraph 153, page 66, add the following sentence:

Renewals or new licenses may be issued a reasonable length of time previous to the expiration of existing licenses, but must bear the exact date of issue, which must correspond with the date on the back of Form 756 forwarded to the Commissioner of Navigation.

Paragraph 162, page 67, should read:

Operators desiring to retain their expired or canceled licenses may make application therefor to the examining officer or to the Commissioner of Navigation. Old licenses returned to operators will be marked "Canceled" or "Expired" in red across their faces, and the service record will be transcribed on the back of Form 756 sent to the Commissioner of Navigation, in accordance with paragraph 154, above.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, February, 1915—No. 2

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instructions, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States, and will contain information concerning Government, commercial, and special stations only. Information regarding amateur stations will appear only in the annual edition of the list of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) will be printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws will be printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.

INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.

Nature of service:

- PG=General public.
 PR=Limited public or limited commercial.
 P=Private.
 O=Government business exclusively.

Hours of operation:

- N=Continuous service.
 X=No regular hours.
 m=a. m.
 s=p. m.
 12 m=Midday.
 12 s=Midnight.
 fr.=Franc (frances).
 c.=Cents.

OTHER ABBREVIATIONS.

- Name =Name of station.
 G. loc. =Geographical location (O=west longitude, N=north latitude).
 Call =Radio call letters.
 System=Radio system used and sparks per second.
 Range =Normal range in nautical miles.
 W. L. =Wave lengths.
 Service=Nature of service.
 Hours =Hours of operation.
 Rates =Ship or coast charges in francs and dollars.
 Notes =Refers to notes in the Berne list.
 Co. =Company.
 Corp. =Corporation.

NEW STATIONS.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the list of radio stations of the United States, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Ship rate.	
				Per word.	Minimum per radiogram.
Bradford ¹	KNG	.....	300, 600	.....	.....
California (WOR) ²	WOR	.....	300, 640	.....	.....
Camaguey ²	KWI	.....	300, 600	.....	.....
Coalinga ⁴	WOT	.....	300, 600	.....	.....
Colon (WHO) ⁵	WHO	Marconi...	300, 600	4 c. (0.20 fr.)...	40 c. (2 fr.)
Dayton ¹	KNP	.....	300, 600	.....	.....
Moreni ¹	KNX	.....	300, 600	.....	.....
Northern Pacific ⁶	WIM	Marconi...	300, 600	4 c. (0.20 fr.)...	40 c. (2 fr.)
Pioneer ¹	KIG	.....	300, 600	.....	.....
Polarine.....	KOI	.....	300, 600	.....	.....
Santiago ²	KWE	.....	300, 600	.....	.....
Satsuma ⁷	KJI	.....	300, 600	.....	.....
Wico ⁸	KNN	Marconi...	300, 600	4 c. (0.20 fr.)...	40 c. (2 fr.)
William O'Brien ⁸	KPN	Marconi...	300, 600	4 c. (0.20 fr.)...	40 c. (2 fr.)
Wm. E. Chapman ⁹	KRM	.....	300, 600	.....	.....

* Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

¹ Standard Oil Co. of New Jersey, owner of vessel.

² John A. Hooper, owner of vessel.

³ New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.

⁴ Union Steamship Co., owner of vessel.

⁵ American-Mexican Steamship & Trading Co., owner of vessel.

⁶ Great Northern Pacific Steamship Co., owner of vessel.

⁷ Barber & Co., owner of vessel.

⁸ East Coast Transportation Co., owner of vessel.

⁹ Merritt & Chapman Derrick & Wrecking Co., owner of vessel.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Call signal.	Station.	Call signal.	Station.
KIG	Pioneer.	KRM	Wm. E. Chapman.
KJI	Satsuma.	KWE	Santiago.
KNG	Bradford.	KWI	Camaguey.
KNN	Wico.	WHO	Colon.
KNP	Dayton.	WIM	Northern Pacific.
KNX	Moreni.	WOR	California.
KOI	Polarine.	WOT	Coalinga.
KPN	William O'Brien.		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of radio stations of the United States only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Hartford, Conn.....	1ZC	200, 300, 425, 800...	P	X	Harry E. Chapman.
Kansas City, Mo.....	9XK	Variable.....	P	X	Robert R. Moore.
Lexington, Mass.....	1ZD	200, 425, 800...	P	X	Samuel W. Dean.
Penikese, Mass.....	1ZP	200, 300, 425, 800...	P	X	James A. B. Thomas.
Springfield, Ill.....	9ZS	600, 800...	P	X	Illinois Watch Co.
St. Louis, Mo.....	9XV	650, 1200, 1500, 2000.	P	X	Washington University.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1ZC	First district:		
1ZD	Hartford, Conn.	9XK	Ninth district:
1ZP	Lexington, Mass.	9XV	Kansas City, Mo.
	Penikese, Mass.	9ZS	St. Louis, Mo.
			Springfield, Ill.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made in the list of radio stations of the United States, and in the International List of Radiotelegraph Stations published by the Berne bureau.]

HULLCREST (DALY CITY), CAL.—Range, 200; system, Marconi, 340.
 HOBOKEN, N. J.—Range, 400; system, Marconi, 1000; W. L., 2250; service, PR; hours, X. Notes: Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Station limited to correspondence with land stations at Scranton, Pa., Binghamton, N. Y., and Buffalo, N. Y., and with trains of the Delaware, Lackawanna & Western Railroad, and is for the purpose of transacting that company's railroad business.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made in the list of radio stations of the United States, and in the International List of Radiotelegraph Stations published by the Berne bureau.]

ADMIRAL DEWEY.—System, Marconi, 400.
 ADMIRAL SCHLEY.—System, Marconi, 400.
 ALAMEDA.—Strike out range; system, Kilbourne & Clark; strike out rates. Note, Alaska Steamship Co., owner of vessel.
 ANTILLES.—System, Marconi, 400.

- CALAMARES.**—Range, 500; system, composite, 1,000; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Calamares Steamship Corp., owner of vessel.
- CHARLTON HALL.**—System, Marconi; rates 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. United States Steel Products Co., owner of vessel.
- COMUS (KKD).**—System, Marconi, 400.
- CONCHO.**—System, Marconi, 400.
- CORDOVA.**—Strike out all particulars.
- CORWIN.**—Strike out all particulars.
- DOLPHIN (WU).**—Strike out all particulars.
- EDITH.**—Strike out all particulars.
- EL DIA.**—System, Marconi, 240.
- EL SIGLO.**—System, Marconi, 240; hours, X.
- E. R. STERLING.**—Range, 100; system, composite, 200; W. L., 300, 450, 600; service, P; hours, X. Notes, Radio station operated and controlled by Sterling Ship Co., owner of vessel.
- FALCON (WRK).**—Strike out all particulars.
- FIFIELD.**—Strike out all particulars.
- FINLAND.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- GENERAL HUBBARD.**—Strike out all particulars.
- GEORGE W. FENWICK.**—Strike out all particulars.
- JEFFERSON (KOD).**—System, Marconi, 400.
- JEFFERSON (WJ).**—Strike out range; system, Kilbourne & Clark; strike out service; strike out hours; strike out rates. Note, Alaska Steamship Co., owner of vessel.
- LAMPASAS.**—System, Marconi, 400.
- LATOUCHE.**—Strike out all particulars.
- MADISON.**—System, Marconi, 400.
- MARIPOSA.**—Strike out range; strike out system; strike out rates. Note, Alaska Steamship Co., owner of vessel.
- MORRO CASTLE.**—System, Marconi, 400.
- NEW YORK (KSN).**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. International Mercantile Marine Co. (American Line), owner of vessel.
- NOME CITY.**—Strike out all particulars.
- NORTHWESTERN (WAN).**—Strike out all particulars.
- NUECES.**—System, Marconi, 400.
- PHILADELPHIA (KSM).**—System, Marconi, 480.
- PIONEER (WPN).**—Strike out all particulars.
- PRINCESS ANNE.**—System, Marconi, 400.
- ROBERT DOLLAR.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.
- SACRAMENTO (WIA).**—Strike out all particulars.
- SANTA ANA.**—Strike out all particulars.
- SEWARD.**—Strike out all particulars.
- SIERRA.**—System, Poulsen arc. Notes, Radio station operated and controlled by the Federal Telegraph Co. Oceanic Steamship Co., owner of vessel.
- ST. PAUL (KSO).**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. International Mercantile Marine Co. (American Line), owner of vessel.
- TATOOSH.**—Strike out all particulars.
- TYEE.**—Strike out all particulars.
- VICTORIA.**—Strike out all particulars.
- WAKIVA (WLA).**—Strike out all particulars.
- WASHINGTONIAN.**—Strike out all particulars.
- YAGUEZ.**—Strike out all particulars.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out particulars after the following call signals: KDY, WAD, WAE, WAI, WAL, WAN, WAR, WAU, WAV, WIA, WKW, WLA, WMT, WNG, WNN, WPC, WPE, WPN, WRF, WRK, WRN.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made in the list of radio stations of the United States only.]

BELONT, Wis.—W. L., 300, 600, 900 variable.

LOS ANGELES, CAL.—W. L., 300, 485, 600 variable.

SLINGERLANDS, N. Y.—W. L., 200, 300, 600, 1000, 1200, 2000, 5500. Radio station controlled by C. F. & B. V. Deitz.

MISCELLANEOUS.

RADIO STATIONS OF THE UNITED STATES.

[Oct. 1, 1914.]

Commercial and special land stations.

Controlled by—	General public.	Limited public.	Limited commercial.	Government official.	Special. ¹	Total.
United States Navy.....	23	.....	.....	25	.....	48
United States Coast Guard Service.....	.....	.....	.....	1	.....	1
United States Army.....	7	.....	.....	32	.....	39
Superintendent United States Capitol Building and Grounds.....	.....	.....	.....	1	.....	1
Insular government, Philippine Islands.....	6	.....	.....	.....	.....	6
Marconi Co.....	58	3	1	.....	.....	62
National Electric Signaling Co.....	1	1	1	.....	.....	3
Tropical Radio Telegraph Co.....	2	.....	.....	.....	.....	2
Federal Telegraph Co.....	.....	6	2	.....	.....	8
Mutual Telephone Co., Hawaii.....	3	2	.....	.....	.....	5
Atlantic Communication Co.....	2	.....	.....	.....	.....	2
Delaware, Lackawanna & Western R. R. Co.....	.....	.....	4	.....	.....	4
Unclassified.....	3	.....	5	.....	54	62
Total.....	105	12	13	59	54	243

Ship stations.

Controlled by—	Number.	Controlled by—	Number.
United States Navy.....	248	Tropical Radio Telegraph Co.....	21
United States Coast Guard Service.....	25	Atlantic Communication Co.....	15
United States Army.....	34	Unclassified.....	197
United States Department of Commerce.....	6	Total.....	895
Marconi Co.....	330		
National Electric Signaling Co.....	19		

Amateur stations licensed.²

District and headquarters.	Number.	District and headquarters.	Number.
1. Boston, Mass.....	374	7. Seattle, Wash.....	114
2. New York, N. Y.....	503	8. Cleveland, Ohio.....	456
3. Baltimore, Md.....	543	9. Chicago, Ill.....	172
4. Savannah, Ga.....	36	Total.....	2,796
5. New Orleans, La.....	36		
6. San Francisco, Cal.....	562		

¹ Including experimental and special amateur.

² To July 1, 1914.

Summary of radio stations of the United States.

Kind of station.	Number.	Kind of station.	Number.
Government land stations.....	95	Government land and ship stations.....	408
Private, commercial, and special land stations.....	148	Private, commercial, special, and private land and ship stations.....	730
Total.....	243	Total.....	1,138
Government ship stations.....	313	Amateur stations licensed.....	2,796
Private, commercial, and private ship stations.....	532	Grand total.....	3,934
Total.....	895		

COMMERCIAL OPERATOR'S LICENSE SUSPENDED.

Under authority of the Radio Communication Laws and Regulations of the United States, page 49, paragraph 5, one of the United States coast guard cutters was recently conducting a range test with a merchant vessel at sea and considerable difficulty was experienced in establishing communication. The operator on the merchant vessel became exasperated and asked the operator on the coast guard cutter why he did not learn to receive, thereby violating the Regulations.

In accordance with section 3 of the act of August 13, 1912, his commercial first-grade license has been suspended by the Secretary of Commerce for a period of one month.

GASOLINE ENGINES.

Gasoline engines may not be installed and operated as a source of auxiliary electric power on passenger vessels previous to the promulgation of the Steamboat-Inspection Service Regulations. The board is now in session.

Those contemplating such installations should bear in mind that the engine should be located with the same view to safety and effective operation as approved storage-battery equipments.

Attention is invited to the act of July 23, 1910, amended June 24, 1912, which requires "auxiliary power supply," and to the service regulations of the London Convention, Article XI, which provides that such emergency power supply shall be located with a view to greatest possible protection against accident, to be determined by the Government issuing the wireless license. Attention is also invited to the laws and regulations, page 49, paragraph 2, which states that the transmitting apparatus operated from the emergency power supply should be capable of functioning within two minutes after unexpected notice to the operator.

COMMERCIAL EXTRA FIRST-GRADE OPERATORS.

The names of the following operators have been added to the list of those to whom commercial extra first-grade licenses have been issued by the Secretary of Commerce, as a reward for long and efficient service: H. W. Sinclair and E. W. Lovejoy, San Francisco, Cal., and J. H. Benson, Philadelphia, Pa.

COMMERCIAL OPERATOR PENALIZED.

About a year ago an operator holding a second-grade commercial operator's license changed the face of his license to read "Commercial first grade," and secured employment thereunder as a commercial first-grade operator.

The case came to the attention of the Department when the operator applied for a renewal of his license, and the Secretary of Commerce suspended his license for a period of one year, and, furthermore, all the papers in the case have been referred to the United States district attorney for prosecution for forgery.

OPERATOR EXAMINATIONS.

The act of August 13, 1912, providing for the licensing of commercial radio operators went into effect December 13, 1912. These licenses are issued for a period of two years, and during the past few months a great deal of attention has been given to their renewal. The attention of all radio operators is invited to the Radio Communication Laws of the United States, edition of July 27, 1914, page 66, paragraphs 152 to 162, inclusive.

Under certain conditions prescribed in the regulations, renewal licenses may be issued without examination, but all operators are warned that they should keep well informed as to the manipulation and operation of modern radio apparatus, and that it is necessary for them to keep posted in regard to any new radio laws or regulations.

Recently an operator holding a commercial first-grade operator license applied to one of the radio inspectors for a renewal of his license without examination, but the service record on the back of his license did not show the required service, so that the applicant was informed that he must take another examination. He took the examination and attained an average of only 36.5 per cent, which did not entitle him to hold even a commercial second-grade license.

Shortly after he had taken the examination he submitted a letter, sworn to by his employer, stating that he had been employed and served as a radio operator on ships during the 90 days specified in the regulations. This affidavit might have been accepted as evidence of satisfactory service in lieu of the service record except that the examination which the operator took demonstrated that the affidavit was not satisfactory evidence and indicated clearly that the applicant was not entitled to hold a first or second grade license under the requirements.

The present regulations and examinations concerning the renewal of operator licenses and reexamination were drawn up with a particular view to eliminate from the ranks those operators who fail to keep abreast of the times.

Any regulation similar to that concerning the reexamination of operators, where a division line is sharply drawn, is bound to appear to be a hardship in some cases.

Referring further to the whole question of the examination of operators, attention is invited to an article in volume 2, number 3, of the "Proceedings of the Institute of Radio Engineers," by V. Ford

Greaves, radio engineer of the Bureau of Navigation. Particular reference is made to the chapter under the heading "Technical knowledge," pages 201 to 204, inclusive.

The operator examination question sheets under the heading "Instructions" provide: "The questions are short, but applicants are expected to state clearly their full knowledge of each subject." No doubt those operators who have performed satisfactory service under a commercial first-grade license, but who fail in the examination for renewal of same, will study and procure their licenses at their next examination. When the operators now holding commercial first-grade licenses become familiar with the requirements concerning reexamination they will undoubtedly take the necessary steps to properly prepare themselves for the reexamination, which is the Bureau's intention.

STORAGE BATTERIES.

The following data concerning the care, operation, and testing of storage batteries are published for the information and guidance of radio inspectors, and it is believed that the information will be valuable to operators and others concerned with the maintenance of storage-battery equipments. Similar data concerning the inspection of the Edison storage battery may be published in a future edition.

With a view to obtaining uniform and consistent inspections and tests of the storage batteries furnished as the auxiliary source of power supply for the radio equipments on board ships, required by the act of July 23, 1912, amending the act of June 24, 1910, the following instructions covering suitable tests are issued:

It is probable that storage batteries of sufficient size and number to be used as the reserve power for the main motor generator set will soon come into more general use.

Tests involving discharging the battery are both uncertain in cases of partial charge and require too much time and aggravate the condition it is desired to correct. Therefore the tests indicated hereafter are made by putting the battery on charge. In addition, the general condition of storage batteries should be noted as to—first, cleanliness (battery trays should be kept clean and dry and free from electrolyte, which tends to short circuits and grounds); second, connections (all connections should be tight and free from verdigris); third, installation (cells or trays should be securely fastened in position to prevent accident in heavy weather or when vessel has listed considerably, conditions probable in emergency); fourth, maintenance (all caps, stoppers, or valves should be in proper position).

Data regarding the storage batteries should be posted in the radio room. This information should indicate the make, type, size, and the charging rates of the cells; also, if possible, information regarding the electrolyte, including information regarding the specific gravity before and after the charges, and records of charge and if any changes have been made in electrolyte.

The tests indicated hereafter may take a maximum of one-half hour time, so that tests should be started immediately on boarding vessel. Arrangements must be made to see that ship voltage is maintained at the proper or normal value. The charging amperage should be known, but the resistance of most panels are fixed so that standard

types will soon be familiar to inspectors. It must be remembered that the batteries provided on vessels may exceed the necessary capacity required to make the set comply with the law, and this fact must be considered before a battery can be rejected. The tests prescribed hereafter are approved by the manufacturers of the different types of batteries involved and a persistent use of the information gained by these tests, if brought to the attention of the proper authorities, will undoubtedly result in an improved maintenance of this equipment. Instructions covering the tests of the batteries made by the Electric Storage Battery Co. are furnished herewith.

The following instructions apply to the inspection of chloride, exide, and ironclad exide types of lead batteries made by the Electric Storage Battery Co., Philadelphia, Pa.:

Types of batteries.—Batteries in wireless service on shipboard, as supplied by the Electric Storage Battery Co., are of several types, viz, exide, chloride, or ironclad exide, and are assembled in rubber jars in wood trays.

Each tray bears a name plate. In the case of exide and ironclad exide the name plate gives the type, number of cells, charging rates, discharge rating, and the normal full-charge specific gravity of the electrolyte. In batteries of the chloride type, the name plate gives the catalogue number of the tray and the normal charging rate.

Voltage.—Put battery on charge at current rate, which is used for giving the battery its overcharge or equalizing charge as defined hereafter.

The charging panels for these types of battery are supposed to be designed so that the proper charging rates are obtained for the following tests when the ship voltage is kept up to normal. Radio inspectors must therefore see that the ship voltage is kept at proper value during the test.

All exide types of batteries on test should be charged at within 10 per cent of the finishing rate. This rate for the different types is rated on the name-plate data and is shown in the accompanying tables. All chloride batteries on test should be charged at within 10 per cent of the normal charging rate as shown on the name plate and in the accompanying tables. For chloride cells, the "finishing" and "normal" charge rates are the same. For exide cells the "finishing" rates are specially indicated.

If the closed current voltage of the battery, under proper charge rate, stops rising within 30 minutes—i. e., reaches a maximum, which is above 2.45 volts per cell (it may go as high as 2.65 volts per cell or over) and cells are gassing freely—battery can be considered as charged. If at the end of 30 minutes proper charge the battery voltage is still rising, but is an average of 2.45 volts per cell, and cells are gassing quite freely, battery can be assumed to be within 15 per cent of being charged—i. e., they can be considered as capable of furnishing within 15 per cent of rated normal full-charge capacity.

If at the end of 30 minutes battery voltage is below an average of 2.45 volts per cell, or cells are gassing but slightly or not at all, battery can not be considered as charged within 15 per cent of full capacity and should be put on charge and charge completed without delay.

Just before the end of charge, read the voltage of one or two cells of each tray of battery with the low-reading voltmeter provided and if these cell-voltage readings agree closely with the average cell

voltage of the battery (found by dividing the battery voltage by the number of cells in battery), it can safely be assumed that all cells are uniform in voltage and no more cell-voltage readings need be taken. If the cell voltages are above the average cell voltage of battery, as defined above, an inspection should be made to discover the defective cells, the presence of which is indicated.

Cell voltages at the end of each of the test charges outlined above will be found to vary somewhat between different batteries, due to type variation, temperature, or age and conditions of plates, and for this reason a fixed voltage value can not be used in these tests.

However, the minimum voltage required in the above tests—namely, 2.45 volts per cell—is considered to allow for all possible conditions which may be encountered and to be equitable to the ship station to a degree which the inspector may safely require. These voltage requirements also apply to the lead batteries made by the European companies affiliated with the Electric Storage Battery Co.

Electrolyte.—The specific gravity of the electrolyte in lead cells is an excellent indication of the condition of the battery if the values and treatments previous to the test are known. If the readings at the end of the last full charge are known and no changes have been made in electrolyte, the readings at the time of tests are reliable indications as to the state of discharge.

So far it has been impracticable to obtain reliable specific gravity data for ship storage batteries, and only those readings taken by radio inspectors can be relied upon and the voltage tests outlined must be the main basis for determining the condition.

Specific gravity.—If time permits, take a few specific-gravity readings of the electrolyte of several cells in different trays as a check on the general condition of the battery.

Marked variation in the specific gravity in the different cells of the battery may be an indication of trouble in the cells in which the gravity is low, and such cells should be carefully checked up, taking voltage readings when charging and noting whether these cells gas equally with other cells.

The specific gravity falls during discharge and rises during charge, and can be used as an indication of the state of charge of the battery provided the gravity at the end of the last full charge is known.

In batteries of the exide and ironclad exide type the normal gravity at full charge is 1.280 at 70° F., but a variation down to 1.250 is allowed. For batteries of the chloride type the normal full-charge gravity is 1.210 at 70° F. with an allowable variation down to 1.190.

As the temperature affects the gravity this must be considered and corrections made as follows: To correct the gravity to normal temperature (70° F.), subtract one point for each 3° F. below 70°, and add one point for each 3° above 70° F. For example, electrolyte which is 1.283 at 61°, or 1.277 at 79°, will be 1.280 at 70°; if 1.213 at 61° or 1.207 at 79°, it will be 1.210 at 70°.

Gassing.—All cells should gas uniformly.

Height of electrolyte.—Remove vent plugs from several cells throughout the battery to make sure the electrolyte covers the plates.

Connections.—See that terminals and connections are tight and free from corrosion.

Additional.—Additional information regarding the batteries manufactured by the Electric Storage Battery Co. can be obtained from the pamphlets and publications issued by this company.

The installation of a recording ampere-hour meter is strongly recommended for all storage battery equipments on shipboard.

TABLE OF CHLORIDE PORTABLE BATTERIES.

[Normal ampere hour capacity can be determined by multiplying the normal discharge rate by 8.]

Cat. No.	Cells in case.	Type and number of plates.	Rate of normal charge and discharge.	Outside dimensions of case.			Height over lugs.	Weight complete.
				Length.	Width.	Height.		
			Amps.	Inches.	Inches.	Inches.	Inches.	Pounds.
801.....	1	"C" 3	1½	3½	5½	8½	10½	8
802.....	2	"C" 3	1½	5½	5½	8½	10½	14
803.....	3	"C" 3	1½	7	5½	8½	18½	20
804.....	4	"C" 3	1½	8½	5½	8½	10½	26
805.....	5	"C" 3	1½	10½	5½	8½	10½	32
401.....	1	"D" 3	2½	3½	7½	10½	11½	15
402.....	2	"D" 3	2½	5½	7½	10½	11½	26
403.....	3	"D" 3	2½	7	7½	10½	11½	37
404.....	4	"D" 3	2½	8½	7½	10½	11½	48
405.....	5	"D" 3	2½	10½	7½	10½	11½	59
406.....	1	"D" 5	5	4½	7½	10½	11½	24
407.....	2	"D" 5	5	7	7½	10½	11½	43
408.....	3	"D" 5	5	9½	7½	10½	11½	62
409.....	4	"D" 5	5	13	7½	10½	11½	81
410.....	5	"D" 5	5	15½	7½	10½	11½	100
411.....	1	"D" 7	7½	5½	7½	10½	11½	33
412.....	2	"D" 7	7½	9½	7½	10½	11½	58
413.....	3	"D" 7	7½	13	7½	10½	11½	83
414.....	4	"D" 7	7½	16½	7½	10½	11½	108
415.....	5	"D" 7	7½	20½	7½	10½	11½	133
501.....	1	"E" 5	10	4½	9½	12½	13½	33½
502.....	2	"E" 5	10	7½	9½	12½	13½	60
503.....	3	"E" 5	10	10	9½	12½	13½	86½
504.....	4	"E" 5	10	13½	9½	12½	13½	113½
505.....	5	"E" 5	10	15½	9½	12½	13½	140
506.....	1	"E" 7	15	5½	9½	12½	13½	42½
507.....	2	"E" 7	15	9½	9½	12½	13½	82½
508.....	3	"E" 7	15	13½	9½	12½	13½	122½
509.....	4	"E" 7	15	17½	9½	12½	13½	163

EXIDE BATTERY DATA, SHOWING FINISHING CHARGE RATE.

Plates in jar.	M. V. ironclad oxide.					M. V. oxide.				
	Charge rate.		4½ hours discharge.	A. H. capacity.	Width of 1½-rib jars. ¹	Charge rate.		4 hours discharge.	A. H. capacity.	Width of 1½-rib jars. ¹
	Start.	Finish.				Start.	Finish.			
	Amps.	Amps.	Amps.		Inches.	Amps.	Amps.	Amps.		Inches.
7.....	19	8	21	94½	2½	19	8	21	84	2½
9.....	24	10	28	126	3½	24	10	28	112	3½
11.....	30	12	35	157½	4½	30	12	35	140	4½
13.....	35	14	42	189	5	40	16	49	168	5
15.....	40	16	49	220½	5½	45	18	56	196	5½
17.....	45	18	56	252	6½	51	20	63	224	6½
19.....	51	20	63	283½	7½	56	22	70	252	7½
21.....	56	22	70	315	8					8

¹ These jars have a uniform length of 6½ inches and height of 12½ inches.

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ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, March, 1915—No. 3

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instructions, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States, and will contain information concerning Government, commercial, and special stations only. Information regarding amateur stations will appear only in the annual edition of the list of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) will be printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws will be printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved: ¹

E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.

INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.

Nature of service:

PG=General public

PR=Limited public or limited commercial.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

fr.=Franc (francs).

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in francs and dollars.

Notes =Refers to notes in the Berne list.

Co. =Company.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.
Akron, Ohio ¹	O 81 33 00	WOI
	N 41 06 00	
Detroit, Mich ¹	O 83 04 00	WOK
	N 42 19 00	

¹ Radio station operated and controlled by the Goodyear Tire & Rubber Co.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Ship rate.	
				Per word.	Minimum per radiogram.
Antilla ¹	KWD		300,600		
Ardmore ¹	KIA		300,600		
Balboa * ²	WHU	Marconi.....	300,600	4 c. (0.20 fr.)	40 c. (2 fr.)
Corning ³	KIH		300,600		

* Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

¹ New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.² Standard Oil Co. of New Jersey, owner of vessel.³ American-Mexican Steamship & Trading Co., owner of vessel.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—continued.

Name.	Call signal.	System.	Wave lengths.	Ship rate.	
				Per word.	Minimum per radiogram.
Dacia * ¹	KGD	Marconi, 500.....	300, 600	4 c. (0.20 fr.)	2 40 c. (2 fr.)
Despatch * ⁴	WOA	Marconi.....	300, 600	8 c. (0.40 fr.)	3 80 c. (4 fr.)
Georgiana * ⁵	KJE	do.....	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Guantanamo * ⁶	KWN	.....	300, 600	.....	.....
Latouche * ⁷	WAI	Kilbourne & Clark.....	300, 600	.....	.....
Owera * ⁸	KZG	Marconi.....	.....	4 c. (0.20 fr.)	40 c. (2 fr.)
Petrolite * ⁹	KIF	.....	300, 600	.....	.....
Santa Ana * ⁷	WAL	Kilbourne & Clark.....	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Westwego * ¹⁰	KGE	Telefunken, 1,000.....	300, 600	4 c. (0.20 fr.)	2 40 c. (2 fr.)
				12 c. (0.60 fr.)	3 \$1.20 (6 fr.)

* Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

¹ Edward N. Breitung, owner of vessel. The station has a range of 150 miles, general public service, with no regular hours.

² North and South American service.

³ Transoceanic service.

⁴ Border Line Transportation Co., owner of vessel.

⁵ Walker, Armstrong Co., owner of vessel.

⁶ New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.

⁷ Alaska Steamship Co., owner of vessel.

⁸ Peter C. Gerry, owner of vessel (yacht).

⁹ Standard Oil Co. of New Jersey, owner of vessel.

¹⁰ Radio station operated and controlled by the Union Petroleum Steamship Co., owner of vessel. The station has a range of 200 miles, general public service, with no regular hours.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Station.	Call signal.	Station.
KGD	Dacia.....b	KZG	Owera.....b
KGE	Westwego.....b	WAI	Latouche.....b
KIA	Ardmore.....b	WAL	Santa Ana.....b
KIF	Petrolite.....b	WHU	Balboa.....b
KIH	Corning.....b	WOA	Despatch.....b
KJE	Georgiana.....b	WOI	Akron, Ohio.....c
KWD	Antilla.....b	WOK	Detroit, Mich.....c
KWN	Guantanamo.....b		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Agricultural College, N. Dak.	9YG	300, 480, 600, variable.	P	X	North Dakota Agricultural College.
Canal Dover, Ohio.....	8ZX	450, 600.....	P	X	Harry S. Weber.
Cincinnati, Ohio.....	8ZF	200, 300, 450, 600.....	P	X	Henry M. Rubel, Jr.
Columbus, Ohio.....	8YO	400.....	P	X	Ohio State University.
Farmington, Conn.....	1ZZ	200, 300, 425, 600.....	P	8s-12s	David Lyon Moore.
Hamilton, Ohio.....	8ZU	300, 600, 8000.....	P	X	Doron Bros. Electric Co.
Hartford, Conn.....	1ZM	200, 300, 425, 600.....	P	7s-11s	Hiram Percy Maxim.
Illinois, Ill.....	9ZK	200, 300, 450, 600.....	P	X	Harry J. E. Knotts, "State-Center Record."
New York, N. Y.....	2XU	300, 600, 2000, 40,000, variable.	P	X	Peter Cooper Hewitt.
Northampton, Mass.....	1ZL	200, 300, 425, 600.....	P	X	Dean A. Lewis.
Springfield, Ohio.....	8ZM	300, 450, 600.....	P	X	Ross McGregor.
St. Louis, Mo.....	9YR	150, 600.....	P	X	St. Louis University.
Wheeling, W. Va.....	8ZW	300, 450, 600, 1800.....	P	X	John C. Stroebel, Jr.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1ZL	First district:	8ZM	Eighth district—continued.
1ZM	Northampton, Mass.	8ZU	Springfield, Ohio.
1ZZ	Hartford, Conn.	8ZW	Hamilton, Ohio.
	Farmington, Conn.	8ZX	Wheeling, W. Va.
2XU	Second district:		Canal Dover, Ohio.
	New York, N. Y.		Ninth district:
8YO	Eighth district:	9YG	Agricultural College, N. Dak.
8ZF	Columbus, Ohio.	9YR	St. Louis, Mo.
	Cincinnati, Ohio.	9ZK	Illinois, Ill.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Alterations and corrections to be made in the list of Radio Stations of the United States, edition of July 1, 1914, and in the International List of Radiotelegraph Stations, published by the Berne bureau.]

HOLLISTER, Cal.—G. loc. (approximate), O 121° 24' 00", N 36° 55' 43"; system, composite, 120 or 240; W. L., 300, 600, 1650.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

Alterations and corrections to be made in the list of Radio Stations of the United States, edition of July 1, 1914, and in the International List of Radiotelegraph Stations, published by the Berne bureau.]

A. G. LINDSAY.—Name, Pavlov.

ALMIRANTE.—Range, 500; system, composite, 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Almirante Steamship Corporation, owner of vessel.

ARGYLL (WTB).—Strike out system; strike out rates. Note, Union Steamship Co. (Union Oil Co.), owner of vessel.

CARRILLO.—Name, Carrillo; range, 500; system, composite, 1000; service, FG; hours, N; rates 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co., Carrillo Steamship Corporation, owner of vessel.

CITY OF EVERETT.—Range, 250; system, Telefunken, 1000; W. L., 300, 600; service, PG; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Atlantic Communication Co. Standard Oil Co. of New York, owner of vessel.

COALINGA.—Note, Union Steamship Co. (Union Oil Co.), owner of vessel.

CRASTER HALL.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.

DORA.—Strike out system; W. L., 300, 600; strike out rates. Note, Alaska Steamship Co., owner of vessel.

EL ALBA.—System, Marconi, 240; hours, X.

EL CID.—Hours, X.

EL NORTE.—Range, 200; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Southern Pacific Co., owner of vessel.

EL SUB.—System, Marconi, 240; hours, X.

GOLIAH.—System, Kilbourne & Clark.

HERMAN FRASCH.—Range, 250; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s. Notes, Radio station operated and controlled by the Atlantic Communication Co. Union Sulphur Co., owner of vessel.

IOWA (WFD).—Strike out all particulars.

MEDINA.—Range, 200; system, Marconi, 240; service, PG; hours, N; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Mallory Steamship Co., owner of vessel.

OCEANA.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Bermuda-American Steamship Corporation, owner of vessel.

OHIOAN.—Range, 200; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Atlantic Communication Co. American Hawaiian Steamship Co., owner of vessel.

OLEUM.—Strike out system; W. L., 300, 600; strike out rates. Note, Fillmore Condit (Union Oil Co.), owner of vessel.

PASTORES.—Range, 500; system, composite, 1000; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Pastores Steamship Corporation, owner of vessel.

POLARINE.—Note, Standard Oil Co. of New York, owner of vessel.

RAYO.—Range, 250; system, Telefunken, 1000; W. L., 300, 600; service, PG; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Atlantic Communication Co. Standard Oil Co. of New York, owner of vessel.

ROMA (WTE).—Strike out system; W. L., 300, 600; strike out rates. Note, Union Steamship Co. (Union Oil Co.), owner of vessel.

SARATOGA (KWS).—System, Marconi, 240.

SEGURANCA.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Edward N. Breitung, owner of vessel.

SOCONY.—Range, 250; system, Telefunken, 1000; W. L., 300, 600; service, PG; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Atlantic Communication Co. Standard Oil Co. of New York, owner of vessel.

TENADORES.—Range, 500; system, composite, 1000; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Tenadores Steamship Corporation, owner of vessel.

VENTURA.—Strike out range; strike out system; strike out rates. Note, Oceanic Steamship Co., owner of vessel.

WASHTENAW.—Strike out range; strike out system; strike out hours; strike out rates. Note, Union Steamship Co. (Union Oil Co.), owner of vessel.

WHITTIER.—Strike out range; strike out system; strike out hours; strike out rates. Note, Max Dyer (Union Oil Co.), owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDE, read: Carrillo (b). Strike out particulars following call signal WFD. **WNO,** read: Pavlof (b).

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

*Alterations and corrections to be made in the list of Radio Stations of the United States, edition of July 1, 1914, only.]

PENIKESSE, MASS.—Strike out all particulars

St. Louis, Mo. (9YC).—Call, 9XC; W. L., 700, variable.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

1ZP—Strike out all particulars. **9YC**—Change call to 9XC, placing information between 9XB and 9XD.

MISCELLANEOUS.

PRICES OF RADIO SERVICE PUBLICATIONS.

The list of Radio Stations of the United States, including amateur stations, is published annually as of July 1, and can be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents per copy.

Copies of the Radio Communication Laws and Regulations of the United States, including the London Radiotelegraphic Convention, etc., may be procured from the Superintendent of Documents at 15 cents per copy.

All orders and inquiries should be addressed direct to the Superintendent of Documents, Government Printing Office, Washington, D. C. Remittances should be made to the Superintendent of Documents by means of coupons, postal or express orders, or certified checks. Postage stamps will not be accepted.

Inquiries concerning the purchase or subscription for the International List of Radio Stations of the World, the International List of Call Letters, and Supplements to both should be addressed direct to the International Bureau of the Telegraph Union, Radiotelegraphic Service, Berne, Switzerland.

OPERATOR'S SERVICE RECORDS.

All operators are warned that any illegal alteration or addition to the service record on the backs of radio operator licenses may constitute a forgery or alteration, and operators may be prosecuted therefor in addition to the suspension of their licenses.

WAVE LENGTHS AND INTERFERENCE.

With the opening of many high-power stations during the last two years the Bureau has received complaints of interference, particularly on the longer wave lengths.

Heretofore, in the issuing of licenses, in very few instances have wave lengths requested by commercial companies been refused. However, some consideration now must be given to the distribution of wave lengths, especially among high-power stations.

The act of August 13, 1912, to regulate radio communication, was designed to execute, in behalf of the United States, the international radiotelegraph convention, and thus to promote the orderly exchange of radiotelegrams.

Section 2 of the act empowers the Secretary of Commerce to specify the wave length or wave lengths which may be used by commercial stations, and hereafter particular attention will be given to this matter and in most cases but one or two wave lengths above 1600 meters will be authorized for high-power stations.

The attention of those concerned is particularly invited to the London Radiotelegraph Convention service regulations, Article XXXV, paragraph 2, concerning the use of the 1800-meter wave length.

Applicants desiring the use of additional wave lengths must submit with Form 761 a detailed statement of the purpose for which additional wave lengths are desired, and such statement will be considered with regard to wave lengths assigned to other stations.

A request for several wave lengths for the purpose of passing from one wave length to another to avoid interference will not be considered.

RADIO SERVICE PERSONNEL.

Changes March 1, 1915:

The headquarters of L. R. Krumm, chief radio inspector, have been transferred to New York.

W. D. Terrell, radio inspector in charge at New York, has been transferred to the radio division of the Bureau of Navigation at Washington.

V. Ford Greaves, radio engineer of the Bureau of Navigation, has been transferred to the radio field service at large and will make a tour of the various radio districts.

THE OHIO FLOOD.

During the recent flood in the Ohio Valley, the Secretary of Commerce detailed J. F. Dillon, radio inspector in charge at Cleveland, to supervise the operation of commercial and amateur radio stations in the district and to cooperate with the authorities to expedite the exchange of messages relative to life and property.

Fortunately the flood did not reach the proportions of the flood of two years ago, and land-line communication was not interrupted. However, Mr. Dillon arranged with the owners of several powerful amateur stations in the flood district to transmit messages if necessary.

Before leaving the district Mr. Dillon inspected many stations with a view to organizing a chain of stations, so that communication can be maintained in the event of a recurrence of the conditions which prevailed during the flood of 1913. Several special amateur station licenses have been granted upon his recommendations.

FALSE CALL LETTERS.

Recently a list of amateur radio stations, published by private parties, came to the attention of the Bureau, and it was observed that several of the call letters of the stations were irregular and probably in some cases constitute violations of the law.

Receiving stations and sending stations which are not required to be licensed under the law should use two-letter or other unofficial signals. All three-letter combinations and the numbers 1 to 9, followed by two or three letters, are official and can only be used by the stations to which they are assigned by the proper Government authority.

Any station using an official call letter or call signal other than that properly assigned may be prosecuted for a violation of section 7 of the act of August 13, 1912.

COMMERCIAL EXTRA FIRST-GRADE OPERATOR EXAMINATIONS.

Naval and other Government operators who submit satisfactory evidence, certifying 18 months' satisfactory service during the two years previous to the date of filing application as radio operator on a Government vessel or at a Government land station open to general public service, are eligible to take the examination for commercial extra first-grade operator licenses, as such service is essentially the same as private commercial service. Government operators are not required by law to hold operator licenses; therefore the requirement that applicants must hold commercial first-grade licenses is waived in such cases.

When the examination papers of applicants for commercial extra first-grade licenses are forwarded to the Bureau of Navigation, evidence of service should be attached showing the number of months of sea service and number of months of land service, as these particulars are incorporated in the licenses when issued.

LONDON RADIOTELEGRAPH CONVENTION.

The following is a list of the countries which have ratified or adhered to the London radiotelegraph convention, giving dates. The letters "A" and "R" denote adherence and ratification respectively.

Country.	Date.	Country.	Date.
Austria.....	Mar. 12, 1914 R	Japan.....	July 16, 1913 R
Belgium (including Belgian Congo).....	Nov. 23, 1912 R	Mexico.....	Oct. 6, 1913 A
Bosnia-Herzegovina.....	Mar. 12, 1914 R	Monaco.....	Dec. 10, 1912 R
Brazil.....	Dec. 18, 1914 R	Morocco.....	Nov. 2, 1914 R
Bulgaria.....	Apr. 27, 1914 R	Netherlands (including colonies).....	Mar. 20, 1913 R
Chile.....	Apr. 16, 1914 R	Nicaragua.....	May 27, 1914 A
Columbia.....	Aug. 25, 1914 A	Norway.....	Aug. 8, 1913 R
Cyrenaica.....	Jan. 13, 1914 A	Panama.....	July 14, 1914 A
Denmark.....	Apr. 29, 1913 R	Portugal.....	Dec. 2, 1913 R
Egypt.....	Feb. 1, 1913 R	Roumania.....	July 5, 1913 R
France (including French West Africa, French Equatorial Africa, Indo-China, Madagascar, and Tunis).....	Feb. 17, 1914 R	Russia.....	Apr. 5, 1913 R
Germany (including protectorates).....	July 5, 1913 R	San Marino.....	Aug. 1, 1913 R
Greece.....	July 24, 1914 R	Santo Domingo.....	July 1, 1913 R
Guatemala.....	July 10, 1914 A	Sarawak.....	Apr. 23, 1914 A
Honduras.....	Feb. 11, 1915 A	Siam.....	May 20, 1913 R
Hungary.....	Mar. 12, 1914 R	Spain.....	July 8, 1913 R
Italy (including colonies of Eritrea and Somalia).....	June 18, 1913 R	Sweden.....	Aug. 8, 1913 R
		Tripolitana.....	Jan. 13, 1914 A
		United Kingdom of Great Britain and Ireland.....	June 2, 1913 R
		United States of America.....	Feb. 21, 1913 R
		Zanzibar.....	July 14, 1913 A

NORMAL WAVE LENGTH.

Every coast station open to general public service is required to have a normal sending and receiving wave length of 600 meters and all general public service with ship stations must be conducted on 300, 600, or 1800 meters.

The Department interprets the radio laws and the London convention to require that every coast station, excepting general and restricted amateur, shall have a normal wave length of 600 meters for use in case of distress or emergency, and licenses issued for such stations so indicate.

The indication of a 600-meter normal wave length for a special station does not mean that the station shall use this wave length for its *normal* business. All radio communication, other than general public service, must be conducted on some authorized wave length other than 300, 600, or 1800 meters, but the station is required, when open and no special business is being conducted, to listen in with the receiving apparatus tuned to receive the 600-meter wave length and must be prepared to transmit on 600 meters if necessary.

The Radio Laws and Regulations, edition of July 27, 1914, page 52, paragraphs 38 to 50, inclusive, bear on this subject and paragraph 44 provides that all coast stations shall listen in at intervals of not more than 15 minutes and for not less than 2 minutes, with the receiving apparatus adjusted to receive a 600-meter wave length. The act of August 13, 1912, section 4, regulation 11, requires general public-service coast stations to listen in at intervals of not less than 15 minutes and for a period of not less than 2 minutes with the receiver tuned to receive messages of 300-meter wave lengths.

SPECIAL AMATEUR STATION LICENSES.

The organization of a chain of stations in the Ohio flood district and the organization of the American Radio Relay League has caused an influx of applications for special amateur station licenses.

The attention of all concerned is invited to the Laws and Regulations, edition of July 27, 1914, page 55, paragraphs 63 and 64. Applications will not be considered by the Department if these requirements are not complied with.

The Bureau is satisfied that the American Radio Relay League is organized with a view to complying with the Laws and Regulations in all particulars, and radio inspectors in submitting their recommendations to the Department as to the issue of special amateur station licenses will give due consideration to an indorsement on an application by the proper officers of the league.

If all the requirements of the Laws and Regulations are complied with, the Bureau will approve a limited number of special amateur inland station licenses for members of the league, authorizing the use of a wave length of 425 meters.

Very few, if any, special amateur station licenses will be approved for stations along the coast or in localities where the operation of such stations may interfere with maritime, Government, or commercial radio communication. All holders of special amateur station licenses or applicants therefor are warned that such licenses may be suspended or revoked if interference is caused by the working of the stations or if any of the Laws and Regulations are violated.

RADIO RATES INCREASED.

The Marconi Wireless Telegraph Co. of America has been authorized to increase the rate of its station at Miami, Fla., for limited public service with the British Government station at Nassau, Bahamas, from 6 cents to 12 cents per word, effective March 15, 1915.

AMENDMENTS.

The list of Radio Stations of the United States, edition of July 1 1914, is hereby amended, as follows:

Introduction, page 9, sentence commencing on the sixth line should read:

"The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent."

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OF THIS PUBLICATION MAY BE PROCURED FROM
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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, April, 1915—No. 4

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instructions, and to those concerned with the operation of Government and commercial radio stations for their information.

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E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.

INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.

Nature of service:

PG=General public.

PR=Limited public or limited commercial.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

fr.=Franc (francs).

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in francs and dollars.

Notes =Refers to notes in the Berne list.

Co. =Company.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Range.	System.	Wave lengths.	Service.	Hours.
Brownsville, Tex.*.....	WUZ	250	U. S. Army, 500...	1000	O	X
Fort Barrancas, Fla.*.....	WZD	125	U. S. Army, 500...	1200	O	X
Fort Crockett, Tex.*.....	WUX	30	U. S. Army, 500...	1200	O	X
Fort Howard, Md.*.....	WZB	50	U. S. Army, 60...	1200	O	X
Fort Morgan, Ala. (WUR)*.....	WUR	30	U. S. Army, 500...	1200	O	X
Fort Rosecrans, Cal.*.....	WUS	30	U. S. Army, 500...	1200	O	X
Fort San Jacinto, Tex.*.....	WUY	30	U. S. Army, 500...	1200	O	X
Fort Screven, Ga.*.....	WZA	30	U. S. Army, 500...	1200	O	X
Fort Whitman, Wash.*.....	WZC	100	U. S. Army, 120...	1200	O	X
Fort Royal, S. C. ¹	NAV	.....	U. S. Navy.....	.....	O	N
Victor, Colo. ^{2, 3}	KIW	160	Composite, 600...	600	(4)	9m-11.30m. (7.30s-11s.
Yerba Buena, Cal. 1, 5.....	NPG	.....	U. S. Navy.....	.....	O	N

*Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

¹Radio station operated and controlled by the United States Naval Radio Service, Radio, Va.

²Radio station operated and controlled by the Ajax Gold Mining Co.

³G. loc., 0 105° 07' 00"-N. 38° 40' 00". (Approximate.)

⁴The station is limited to correspondence with a station at Denver, Colo.

⁵G. loc., 0 122° 22' 02"-N. 37° 48' 30."

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Range.	Wave lengths.	Service.	Hours.
Col. Geo. Armistead* ¹	WYG	U. S. Army, 500.....	150	600	O	X.
Cordova ²	WAR	Kilbourne & Clark.....		300, 600		
Evangeline ^{3, 4, 5}	KII	Marconi.....		300, 600		
Genl. R. H. Jackson* ⁶	WYW	U. S. Army, 500.....	30	400	O	X.
Genl. Robt. Swartout* ⁶	WYU	U. S. Army, 500.....	30	400	O	X.
Genl. S. B. Holabird* ⁶	WYV	U. S. Army, 500.....	30	400	O	X.
J. A. Moffett ^{7, 8}	WRE	Marconi.....		300, 600		
Lieut. A. H. Cushing* ⁹	WYX	U. S. Army, 500.....	30	400	O	X.
Lieut. Geo. M. Harris* ⁹	WYR	U. S. Army, 500.....	30	400	O	X.
Mexicano ²	KGM					
Muskogee ²	KIB			300, 600		
Security ^{2, 4, 10}	KSJ	Marconi.....				
Tatoosh ^{4, 11}	WPE	Kilbourne & Clark.....				
Ulysses ¹²	KPU					
Zara ^{2, 4, 12}	KZI	Marconi.....				

*Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

¹ Army mine planter.

² Alaska Steamship Co., owner of vessel.

³ Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

⁴ Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.

⁵ Alonzo W. Perry, owner of vessel.

⁶ Army tug.

⁷ Standard Oil Co. of California, owner of vessel.

⁸ Pierce Oil Corporation, owner of vessel.

⁹ Standard Oil Co. of New Jersey, owner of vessel.

¹⁰ Standard Oil Co. of New York, owner of vessel.

¹¹ Radio station operated and controlled by the Puget Sound Tug Boat Co., owner of vessel.

¹² Maryland Steel Co., owner of vessel.

¹³ F. J. Littlefield, owner of vessel (yacht).

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station,]

Call signal.	Name.	Call signal.	Name.
KGM	Mexicano.....b	WUX	Fort Crockett, Tex.....c
KIB	Muskogee.....b	WUY	Fort San Jacinto, Tex.....c
KII	Evangeline.....b	WUZ	Brownsville, Tex.....c
KIW	Victor, Colo.....c	WYG	Col. Geo. Armistead.....b
KPU	Ulysses.....b	WYR	Lieut. Geo. M. Harris.....b
KSJ	Security.....b	WYU	Genl. Robt. Swartout.....b
KZI	Zara.....b	WYV	Genl. S. B. Holabird.....b
NAV	Port Royal, S. C.....c	WYW	Genl. R. H. Jackson.....b
NPO	Yarba Buena, Cal.....c	WYX	Lieut. A. H. Cushing.....b
WAR	Cordova.....b	WZA	Fort Screven, Ga.....c
WPE	Tatoosh.....b	WZB	Fort Howard, Md.....c
WRE	J. A. Moffett.....b	WZC	Fort Whitman, Wash.....c
WUR	Fort Morgan, Ala.....c	WZD	Fort Barrancas, Fla.....c
WUS	Fort Rosecrans, Cal.....c		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Auburn, N. Y.....	8YA	300, 440, 500, 600...	P	9-9.30m 2-2.30s 7-7.30s	Edward L. Colby (Colby's Telegraph School).
Beeville, Tex.....	5ZN	200, 450.....	P	X	Ed. Nettelton.
Buffalo, N. Y.....	8ZB	200, 300, 425, 600...	P	X	Nelson E. Holt.
Burlington, Iowa.....	9XL	200 to 650 variable.	P	X	Leslie W. Lyon.
Iowa City, Iowa.....	9YA	535.....	P	X	State University of Iowa.
Kane, Pa.....	8ZK	200, 425.....			John Fleming.
Schenectady, N. Y.....	2ZB	200, 300, 400, 600...	P	X	Wallace L. Brooks.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
22B	Second district: Schenectady, N. Y.	82B	Eighth district—continued. Buffalo, N. Y.
52N	Fifth district: Beeville, Tex.	82K	Kane, Pa.
8YA	Eighth district: Auburn, N. Y.	9XL	Ninth district: Burlington, Iowa.
		9YA	Iowa City, Iowa.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berns bureau.]

ARLINGTON, RADIO, VA.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals twice daily for five minutes on the wave length of 2,500 meters, commencing at 11.55m and 9.55e, Sundays and holidays included. Final signals at 12m and 10s (time of the meridian 75° west of Greenwich). Every tick of the standard clock of the Naval Observatory, Washington, D. C., is transmitted as a dot, omitting the twenty-ninth second of each minute, the last five seconds of each of the first four minutes, and finally the last 10 seconds of the last minute. The 12m and 10s signal is a dash.

BENTON HARBOR (WBN), MICH.—Strike out all particulars.

BOLINAS, CAL.—G loc. (exact) O 122° 43' 33", N. 37° 54' 48".

CAPE MAY, N. J.—Range, 150; W. L., 300, 550, 600.

EL PASO, TEX.—Strike out all particulars.

EUREKA (KPM), CAL.—Range, 200; system, Marconi; 226; W. L., 300, 600; hours, 8.30m–6s, 7.30e–5m.

EUREKA (NPW), CAL.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals daily at noon (time of the meridian 120° west of Greenwich), Sundays and holidays excluded, on the wave length of 1,400 meters. Signals same as for Arlington, Radio, Va. Time furnished by Observatory at Navy Yard, Mare Island, Cal.

FORT OMAHA, NEBR.—Strike out all particulars.

FORT WORTH, TEX.—Strike out all particulars.

GRAND MARAIS, MINN.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The station also communicates with Duluth, Minn.

KEY WEST, FLA.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals daily at noon (time of the meridian 75° west of Greenwich), Sundays and holidays included, on the wave length of 1,000 meters. Signals same as for Arlington, Radio, Va. Time furnished by the Naval Observatory at Washington, D. C.

MARE ISLAND, CAL.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals twice daily for five minutes on the wave length of 2,500 meters, commencing at 11.55m and 9.55s, Sundays and holidays included. Final signals at 12m and 10s (time of the meridian 120° west of Greenwich). Signals same as for Arlington, Radio, Va. Time furnished by Observatory at Navy Yard, Mare Island, Cal.

MIAMI, FLA.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The station also exchanges correspondence with Nassau (Bahamas), charge: 12 c. (0.60 fr.) per word, without minimum.

NEW ORLEANS (NAT), LA.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station handles public correspondence in emergencies, when the coast rate will be furnished on request. The operator is generally at the receiver at the beginning of each hour. The station is open for the general benefit of shipping. The station sends out information concerning obstructions in paths of navigation such as wrecks, derelicts, etc., and aids to navigation deranged or misplaced four times daily, at 8m, 12m, 4s, and 8s. The station also sends local weather forecasts at 12m and storm warnings four times at hours mentioned above. The station furnishes above

- information to passing ships at other hours on request. The station sends time signals daily at noon (time of the meridian 75° west of Greenwich), Sundays and holidays included, on the wave length of 1,000 meters. Signals same as for Arlington, Radio, Va. Time furnished by the Naval Observatory, Washington, D. C.
- NEW YORK (WHB).**—Notes, Radio station operated and controlled by the New York Herald Co. The station transmits daily news without charge, using a wave length of 1,610 meters. No charge is made for radiograms to or from naval vessels.
- NORTH HEAD, WASH.**—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals daily at noon (time of the meridian 120° west of Greenwich), Sundays and holidays excluded, on the wave length of 2,000 meters. Signals same as for Arlington, Radio, Va. Time furnished by Observatory at Navy Yard, Mare Island, Cal.
- PHILADELPHIA (WHE), PA.**—Hours, 9m-5.30s.
- SAN DIEGO (NPL), CAL.**—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals daily at noon (time of the meridian 120° west of Greenwich), Sundays and holidays excluded, on the wave length of 2,000 meters. Signals same as for Arlington, Radio, Va. Time furnished by Observatory at Navy Yard, Mare Island, Cal.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- ADELINE SMITH.**—Range, 200; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- ADVANCE.**—Note, Radio station operated and controlled by the Panama Railroad Co., owner of vessel.
- ALASKAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- ALBERTA.**—System, Marconi; rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. F. D. Bourne, owner of vessel (yacht.)
- ALGONQUIN (KVG).**—System, Marconi, 400.
- AL-KI.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Border Line Transportation Co., owner of vessel.
- ALLIANCA.**—Note, Radio station operated and controlled by the Panama Railroad Co., owner of vessel.
- AMERICAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- ANCON.**—Note, Radio station operated and controlled by the Panama Railroad Co., owner of vessel.
- ARIZONAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- AROLINE.**—Range, 150; system, Marconi, 240.
- ASTRAL.**—Range, 200; system, Marconi, 240; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.
- ASUNCION (WTX).**—System, Marconi, 120; W. L., 300, 600; service, PG. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- ATLAS (WTT).**—Range, 150; system, Marconi, 290.
- BALBOA.**—Range, 150; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- BRABANT.**—Range, 200; system, Marconi, 480; service, PG; hours, X.
- CALIFORNIA (WOR).**—Range, 150; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. John A. Hooper, owner of vessel.

- CALIFORNIAN (WKC).**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- CAROLINA (KGB).**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.
- CASSANDRA (KYE).**—Note, John J. Doyle, owner of vessel (yacht).
- CHICAGO (WAC).**—System, Kilbourne & Clark. Note, Radio station operated and controlled by the Booth Fisheries Co., owner of vessel.
- CITY OF EVERETT.**—Notes, Radio station operated and controlled by the Standard Oil Co. of New York, owner of vessel.
- CITY OF SOUTH HAVEN.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Chicago and South Haven Steamship Co., owner of vessel.
- COLON (KMX).**—Note, Radio station operated and controlled by the Panama Railroad Co., owner of vessel.
- COLON (WHO).**—Range, 150; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- COLUMBIAN (WKS).**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- COLUSA.**—Range, 200; system, Marconi, 480; service, PG; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- CORONADO.**—Range, 100; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- CRISTOBAL.**—Note, Radio station operated and controlled by the Panama Railroad Co., owner of vessel.
- DAMARA.**—Range, 200; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- E. G. CROSBY.**—Strike out all particulars.
- EL SEGUNDO.**—Range, 150; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- EVELYN.**—Strike out all particulars.
- FRANK H. BUCK.**—Range, 200; system, Marconi, 120; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- GEORGIA (WFA).**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Goodrich Transit Co., owner of vessel.
- GEORGIANA.**—Rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.
- GULFLIGHT.**—Range, 200; system, Marconi, 240; service, PG; hours, X; rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.
- HAWAIIAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- HENRY T. SCOTT.**—Range, 150; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- HERMOSA.**—Range, 150; system, Marconi, 120; W. L., 300, 500, 600; hours, X; rate, 1 c. (0.05 fr.) per word, 10 c. (0.50 fr.) minimum per radiogram.
- IOWAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- ISTHMIAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- JAMESTOWN.**—Range, 400.
- KANSAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.

- KENTUCKIAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- LAKELAND.**—Range, 125; system, Marconi, 120.
- LAKEWOOD.**—Range, 100; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram.
- LANSING.**—Strike out range; strike out system. Note, Union Steamship Co. (Union Oil Co.), owner of vessel.
- LIGONIER.**—Range, 200; system, Marconi, 400; W. L., 300, 600; service, PG. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Gulf Refining Co., owner of vessel.
- LOUISE.**—Strike out all particulars.
- LYRA (WNF).**—Name, Hattie Luckenbach.
- MARIPOSA.**—System, Kilbourne & Clark.
- METAPAN.**—Range, 500; system, composite, 1000; service, PG; hours, N; rate, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Metapan Steamship Corporation, owner of vessel.
- MEXICAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- MILLINOCKET.**—Hours, X.
- MISSOURIAN.**—Range, 350; system, Telefunken, 1000; hours, X. Notes, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- MOMUS.**—System, Marconi, 400.
- MONTANAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- MULTNOMAH.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- NEBRASKAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- NEVADAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- NORTHERN PACIFIC.**—Range, 200; system, Marconi, 1000; service, PG; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- NORTHLAND (WNX).**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- NORTHWESTERN (KUO).**—Range, 200; system, Marconi, 480; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.
- NUSHAGAK.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Alaska Packers' Association, owner of vessel.
- NYACK.**—Strike out all particulars.
- OHIOAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- OREGONIAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- PACIFIC.**—Range, 200; system, composite, 1000.
- PANAMA (KMH).**—Note, Radio station operated and controlled by the Panama Railroad Co., owner of vessel.
- PANAMAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- PENNSYLVANIAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- RED CROSS.**—Strike out all particulars.
- REDONDO.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Alaska Steamship Co., owner of vessel.
- REUCE.**—Strike out system. Note, Columbia River Packers' Association, owner of vessel.

- SANTA RITA.**—Strike out system. Note, United Steamship Co. (Union Oil Co.), owner of vessel.
- SEGURANCA.**—System, Marconi, 480; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- SHEBOYGAN.**—Range, 150; system, Marconi; W. L., 300, 600; service, PG; hours, X; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram.
- SHENANGO (WET).**—Range, 150; system, Marconi, 120; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram.
- S. O. Co. No. 91.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- S. O. Co. No. 93.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- S. O. Co. No. 95.**—Range, 100; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- ST. NICHOLAS.**—Strike out system. Note, Columbia River Packers' Association, owner of vessel.
- TEXAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- THE HARVESTER.**—Range, 200; system, Marconi, 240; service, PG; hours, X.
- TRINIDADIAN.**—Range, 200; system, Marconi, 400; service, PG; hours, X; rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.
- UNITED STATES.**—Range, 100; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Indiana Transportation Co., owner of vessel.
- VESTA (KTS).**—Range, 200; system, Marconi, 480; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- VIRGINIA (WFH).**—Range, 150; system, Marconi, 120; hours, X.
- VIRGINIAN (WKV).**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- WARRIOR.**—Name, Wayfarer. Note, Alfred G. Vanderbilt, owner of vessel (yacht).
- WILLIAM P. SNYDER.**—Range, 150; system, Marconi-United, 120.
- WILPEN.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Shenango Steamship Co., owner of vessel.
- WM. F. HERRIN.**—System, Marconi, 240.
- YALE.**—Range, 150.
- ZAPORA.**—System, Kilbourne & Clark. Note, International Fisheries Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KYW, read: Wayfarer (b); WNF, read: Hattie Luckenbach (b). Strike out particulars following the call signals KNE, KRL, KRX, WEJ, and WEL.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, only.]

CAMBRIDGE, MASS. (1XP).—W. L., 300, 600, variable.

MEMPHIS, TENN. (5ZD).—W. L., 296.

MISCELLANEOUS.**SPECIAL SERVICE.**

The attention of owners and operators of commercial radio stations is invited to the Laws and Regulations, page 54, paragraphs 49 and 50. General public service may be defined as paid business between coast and ship or ship and ship stations, on the wave lengths of 300, 600, or 1,800 meters, conducted at a speed of not less than 20 words per minute. All special service, such as limited public service or other point-to-point communication, and all press items, must be conducted on some authorized wave length, not interfering with general public service.

STATION LICENSES.

Applications for station licenses (Form 761) must be submitted in the name of the person, company, or corporation controlling and operating the radio station and responsible under the law for the operation and for the radio accounts. The applications must be signed by the applicant or by an officer of the company or corporation.

TRANSMISSION OF TIME SIGNALS BY NAVAL RADIO STATIONS.

The transmission of time signals to vessels at sea by means of radiotelegraphy was first accomplished in the United States in 1905, and this service, enlarged and extended, has continued to the present time. This service is of the greatest value to mariners, as it furnishes a means by which the time, as given by the transmitted signals, may be compared with a ship's chronometer and the error of the chronometer found. Similar comparisons over a number of days enable data to be obtained by which not only the error may be found, but also the chronometer rate; that is, the rate at which it is gaining or losing.

The noontime signals on the Atlantic coast are sent out through the coast radio stations by connection with Western Union telegraph lines from the United States Naval Observatory at Washington, D. C. By the operation of proper relays in electrical circuits, the beats of the seconds of a standard clock in the observatory are sent out broadcast as a series of radio dots, commencing five minutes before the time of the final signal. By omitting certain dots in a series, the comparison between the dots and the beats of the chronometer seconds can be checked until the instant of local noon (seventy-fifth meridian time) is reached. This is marked by a longer dot, which gives the time of exact noon. A comparison with the chronometer time at that instant gives its error referred to the seventy-fifth meridian time. Applying the difference in longitude, namely, five hours, between the seventy-fifth meridian and Greenwich, which is the standard meridian (or 0° longitude), the error of the chronometer referred to Greenwich time is determined.

Time signals are now sent out on the Atlantic coast only through the radio stations at Arlington, Key West, and New Orleans. Signals from Arlington, which reach a zone formerly served by other coast stations, are sent out every day in the year twice a day, viz, at noon and 10 p. m., seventy-fifth meridian time. Time signals from

Key West and New Orleans are sent out daily, including Sundays and holidays, commencing at 11.55 a. m., seventy-fifth meridian time, and ending at local noon.

In case of failure of the Arlington high-power station, the signals are sent out by the small set in the same station, and the stations at Boston, Newport, Norfolk, and Charleston are notified, and they each send the signals broadcast.

On the Pacific coast the time signals are sent broadcast to sea through the naval radio stations at Mare Island, Eureka, and San Diego, Cal., and at North Head, Wash. The controlling clock for each station is in the naval observatory at the Mare Island Navy Yard. Signals from Mare Island are sent out every day from 11.55 to noon, and from 9.55 to 10 p. m., one hundred and twentieth meridian standard time. Those from North Head, Eureka, and San Diego are sent out daily, excluding Sundays and holidays, from 11.55 to noon, one hundred and twentieth meridian standard time.

To get the maximum clearness of signals, the receiving circuit should be tuned to that of the sending station. Arlington and Mare Island send on a 2,500-meter wave length, North Head and San Diego on a 2,000-meter wave length, Eureka on a 1,400-meter wave length, and Key West and New Orleans on a 1,000-meter wave length. On the completion of the new radio station at the training station, Great Lakes, time signals will be transmitted from that station for the benefit of shipping on the Great Lakes, as well as the weather reports for that region, now transmitted by Arlington after the Atlantic coast weather bulletin, following the 10 p. m. time signals.

RENEWAL OF STATION AND OPERATOR LICENSES.

Applicants for renewal of station and operator licenses must submit the originals of old licenses with application for renewal of same. Operators should be sure to have their service records on the backs of their licenses complete at all times, giving the time of service at all stations at which they are employed.

OPERATOR'S LICENSE SUSPENDED.

A commercial operator recently applied to the examining officer at the Philadelphia Navy Yard for a renewal of his first-grade license, and upon examination of his expired license it was found that the service record on the reverse side contained a fraudulent entry.

The operator has been severely reprimanded by the Secretary of Commerce, through the examining officer at the Philadelphia Navy Yard, and his license has been suspended for a period of three months.

COMMERCIAL OPERATOR REPRIMANDED.

The attention of all operators is invited to the Laws and Regulations, page 74, paragraph 210, regarding the use of profane or obscene words in radio communication. Several cases of violations of this regulation have been reported to the Bureau recently. An operator, reported by the radio inspector of the first district, for abbreviating messages in a reprehensible manner, was severely reprimanded by the Secretary of Commerce, and future violations may be subject to more drastic action.

AMATEUR PENALIZED.

An amateur of Portland, Me., was reported recently for operating a station in that city without a license. Judge Hale of the district court of Portland found the amateur guilty and imposed a fine.

RATES.

The rate of 42 cents per word for radiograms transmitted to vessels at sea, at a distance of 400 miles, authorized for the South Wellfleet station of the Marconi Wireless Telegraph Co. of America, was made effective on November 12, 1914. The increase in the ship rates from 2 cents to 4 cents per word and the coast rate from 3 cents to 6 cents per word, authorized for the Pacific stations of the Marconi Wireless Telegraph Co. of America for the North and South American service, was made effective on February 1, 1915.

AMENDMENTS.

[To be cut out and pasted in your copy.]

The Radio Communication Laws of the United States, edition of July 27, 1914, are hereby amended as follows:

Paragraph 153, page 66, should read:

Renewal licenses may be issued to commercial grade operators without examination, provided the service records on the backs of licenses properly certify to three months' satisfactory commercial service during the last six months of the license term. If expired licenses have been lost or destroyed, an affidavit must be submitted attesting the facts regarding the manner in which the license was lost. In such cases, evidence of the required satisfactory commercial service may be submitted in the form of letters, signed by masters and employers.

Operators holding licenses of grades other than commercial, who submit satisfactory evidence to the examining officer, showing actual operation of radio apparatus for three months during the last six months of the license term, may be issued new licenses without examination. Otherwise, applicants for renewals will be examined in the usual manner.

Renewals or new licenses may be issued a reasonable length of time previous to the expiration of existing licenses, but must bear the exact date of issue, which must correspond with the date on the back of Form 756 forwarded to the Commissioner of Navigation.

Service records must be completed and signed only by masters, employers, or the duly authorized agents of either.

Any improper alteration of the service record, or the forgery of masters' or employers' signatures, constitute a violation of the regulations, and the operator may suffer suspension of license for a period not exceeding one year, at the discretion of the Secretary of Commerce.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, May, 1915—No. 5.

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1916.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instructions, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States, and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the list of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.

INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.

Nature of service:

PG=General public.

PR=Limited public or limited commercial.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in cents. (The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refers to notes in the Berne list.

Co. =Company.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Canton, Ohio * ¹	O 81 22 00 N 40 48 00	WQP	100	.....	500
Denver, Colo.* ²	O 105 00 00 N 39 45 00	KIX	100	.....	600
Kvichak River, Alaska * ³	O 156 37 50 N 59 05 45	KML	20-30	Composite, 1000...	300, 500, 600
Lents, Oreg. ⁴	O 122 35 00 N 45 23 00	KFU	.....	Poulsen arc.....	.....
Mount Vernon, Ohio * ⁵	O 82 31 00 N 40 24 00	WQV	80-90	.....	500
Naknek, Alaska (KMK) * ⁶	O 156 25 00 N 58 43 20	KMK	300	Composite.....	300, 500, 600
Ugashik, Alaska * ⁷	O 157 35 00 N 57 34 28	KMU	50-70	Composite, 400....	300, 500, 600

*The station has private service, with no regular hours.

¹ Radio station operated and controlled by Henry L. Ley. The station is limited to correspondence with a station at Mount Vernon, Ohio.² Radio station operated and controlled by William H. Smith. The station is limited to correspondence with a station of the Ajax Gold Mining Co., Victor, Colo.³ Radio station operated and controlled by the North Alaska Salmon Co. The station is limited to correspondence with ship and shore stations of the North Alaska Salmon Co.⁴ Radio station operated and controlled by the Federal Telegraph Co.⁵ Radio station operated and controlled by Bunyan J. Hyatt. The station is limited to correspondence with a station at Canton, Ohio.⁶ Radio station operated and controlled by the Naknek Packing Co.⁷ Radio station operated and controlled by the Red Salmon Canning Co. The station is limited to correspondence with stations of the Naknek Packing Co.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Service.	Hours.
Columbine ¹	NLL	U. S. Bureau of Standards, 1000.	600, 750, 1000	O	X
Cypress ¹	NLM	do.....	600, 750, 1000	O	X
Dolphin (WAU) ² , ³	WAU	Kilbourne & Clark.....	300, 600	.....	.....
Expansion ⁴	WOH	Composite, 100.....	300, 500, 600	P	X
Gulfcoast ⁵ , ⁶	KUE	Marconi.....	300, 600	.....	.....
Jim Butler ⁷	WIL	do.....	.....	.....	.....
Nokomis ⁸	WCW	.....	.....	.....	.....
Northwestern (WAN) ² , ³	WAN	Kilbourne & Clark.....	300, 600	.....	.....
Portland ⁶ , ⁹	WNV	Kilbourne & Clark, 120.	300, 600	PG	X
Ramos ¹⁰	KER	Fessenden.....	300, 600	.....	.....
Seantor Bailey ³ , ¹¹	KGS	Composite, 350.....	300, 600	PG	.....
Southerner ⁶ , ¹²	KJF	Marconi.....	300, 600	PG	.....
Sultana ¹³	KZH	do.....	.....	.....	.....
Wapama ¹⁴	WMG	do.....	.....	.....	.....

¹ Radio station operated and controlled by the United States Department of Commerce, Bureau of Lighthouses.

² Alaska Steamship Co., owner of vessel.

³ Rates, 4 c. per word, 40 c. minimum per radiogram.

⁴ Radio station operated and controlled by the North Alaska Salmon Co., owner of vessel.

⁵ Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Gulf Refining Co., owner of vessel.

⁶ Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

⁷ Olson & Mahony, owner of vessel.

⁸ Horace E. Dodge, owner of vessel (yacht).

⁹ The station has a range of 300 miles. Radio station operated and controlled by the Nynco Line (Inc.), owner of vessel.

¹⁰ Sloan, Dannenhower Co., owner of vessel.

¹¹ The station has a range of 200 miles. Radio station operated and controlled by the Steele Towing & Wrecking Co., owner of vessel.

¹² Walker, Armstrong & Co., owner of vessel.

¹³ Mrs. Mary W. Harriman, owner of vessel (yacht).

¹⁴ Charles R. McCormick & Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b— ship station; c— land station.]

Call signal.	Station.	Call signal.	Station.
KER	Ramos.....b	NLM	Cypress.....b
KFU	Lents, Ore.....c	WAN	Northwestern.....b
KGS	Seantor Bailey.....b	WAU	Dolphin.....b
KIK	Denver, Colo.....c	WCW	Nokomis.....b
KJF	Southerner.....b	WIL	Jim Butler.....b
KMK	Naknek, Alaska.....c	WMG	Wapama.....b
KML	Kvichak River, Alaska.....c	WNV	Portland.....b
KMU	Ugashik, Alaska.....c	WOH	Expansion.....b
KUE	Gulfcoast.....b	WQP	Canton, Ohio.....c
KZH	Sultana.....b	WQV	Mount Vernon, Ohio.....c
NLL	Columbine.....b		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of radio stations of the United States, edition of July 1, 1914, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Fargo, N. Dak.....	9YF	300, 600.....	P	X	Theo. L. Wanner.
Hartford, Conn. (1ZT).....	1ZT	200, 425.....	P	7s-11s	Clarence D. Tuska.
Montauk, Long Island, N. Y.....	2XE	300, 600, variable.....	P	X	Western Electric Co.
New Castle, Pa.....	8ZN	200, 425.....	P	X	R. L. Patch.
New York, N. Y. (2XR).....	2XR	Variable.....	P	X	Marconi Co.
Orono, Me.....	1XK	280, 590, 800.....	P	X	University of Maine.
Rock Island, Ill.....	9XR	500.....	P	X	Robert K. Karlowa and Ray E. Hall (Tri-City Radio Laboratory).
Schenectady, N. Y. (2XI).....	2XI	1600 to 10,000, variable.....	P	X	General Electric Co.
Warren, Ohio.....	8XW	1800.....	P	X	Goodyear Tire & Rubber Co.
Wichita, Kans.....	9YE	1700.....	P	X	Walter S. Ezell.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XK	First district:		Eighth district:
1ZT	Orono, Me.....	8XW	Warren, Ohio.
	Hartford, Conn.....	8ZN	New Castle, Pa.
2XE	Second district:		Ninth district:
2XI	Montauk, Long Island, N. Y.....	9XR	Rock Island, Ill.
2XR	Schenectady, N. Y.....	9YE	Wichita, Kans.
	New York, N. Y.....	9YF	Fargo, N. Dak.

ALTERATIONS AND CORRECTIONS.**LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.**

[Alterations and corrections to be made to the list of radio stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

AKRON, OHIO.—G. loc. (approximate) O 81° 40' 00", N. 41° 10' 00"; range, 350; system, Composite, 300-960; W. L., 300, 600, 2070; hours, 8m-4.30s; rate, 2½ c. per word, 25 c. minimum per radiogram. Notes, Radio station operated and controlled by the Goodyear Tire & Rubber Co. The station is limited to correspondence with the station of the Goodyear Tire & Rubber Co. at Detroit, Mich.

BOSTON (NAD), MASS.—Strike out note regarding time signals.

CHARLESTON, S. C.—Strike out note regarding time signals.

DETROIT (WOK), MICH.—G. loc. (approximate) O 83° 10' 00", N. 42° 20' 00"; range, 300; system, Composite, 300 and 600; W. L., 300, 600, 2070; hours, 8.30m-4.30s; rate, 2½ c. per word, 25 c. minimum per radiogram. Notes, Radio station operated and controlled by the Goodyear Tire & Rubber Co. The station is limited to correspondence with the station of the Goodyear Tire & Rubber Co. at Akron, Ohio.

EUREKA (NPW), CAL.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals daily at noon (time of the meridian 120° west of Greenwich), Sundays and holidays excluded, on the wave length of 1600 meters. Signals same as for Arlington, Radio, Va. Time furnished by Observatory at Navy Yard, Mare Island, Cal.

KAHUKU, HAWAII.—Name, Wahiawa; strike out G. loc. range, 300; system, Marconi-Maesie, 600; W. L., 300, 600.

KEY WEST, FLA.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals daily at noon (time of the meridian 75° west of Greenwich), Sundays and holidays included, on the wave length of 1500 meters. Signals same as for Arlington, Radio, Va. Time furnished by Naval Observatory at Washington, D. C.

MARE ISLAND, CAL.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals twice daily for five minutes on a wave length of 1600 meters, commencing at 11.55m and 9.55s, Sundays and holidays included. Final signals at 12m and 10s (time of the meridian 120° west of Greenwich). Signals same as for Arlington, Radio, Va. Time furnished by Observatory at Navy Yard, Mare Island, Cal.

NEWPORT (NAF), R. I.—Strike out note regarding time signals.

NORFOLK, VA.—Strike out note regarding time signals.

PORT ROYAL, S. C.—G. loc., O 80° 41' 00", N. 32° 22' 00".

SEA GATE, N. Y.—System, Marconi, 120 and 420.

TATOOSH, WASH.—Strike out note regarding time signals.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ADMIRAL DEWEY.—Strike out range; system, Kilbourne & Clark. Note, Radio station operated and controlled by the Pacific-Alaska Navigation Co., owner of vessel.

ADMIRAL FARRAGUT.—Strike out range; system, Kilbourne & Clark; W. L., 300, 600. Note, Radio station operated and controlled by the Pacific-Alaska Navigation Co., owner of vessel.

ADMIRAL SCHLEY.—Strike out range; system, Kilbourne & Clark. Note, Radio station operated and controlled by the Pacific-Alaska Navigation Co., owner of vessel.

ADVENTURESS.—Strike out all particulars.

BELUGA.—Strike out all particulars.

BERTHA.—Strike out all particulars.

BRILLIANT (KTI).—System, Marconi, 1000.

BUENAVENTURA.—Range, 200; system, Marconi, 480; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

CALIFORNIAN (WKC).—Range, 200; hours, 9m–12m, 2s–5s, 8s–10.30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.

CAMAGUEY.—Range, 200; system, Marconi, 400; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. New York and Cuba Mail Steamship Co. (Ward Line), owner of vessel.

CHARLES E. HARWOOD.—Range, 200; system, Marconi, 300; service, PG; hours, X.

CITY OF TOPEKA.—System, Marconi, 400.

COL. E. L. DRAKE.—System, Marconi, 120; W. L., 300, 600; service, PG.

COLORADO (KEA).—Range, 200; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Mallory Steamship Co., owner of vessel.

C. W. MORSE.—Range, 150; system, Marconi, 400; rate, 4 c. per word, 40 c. minimum per radiogram.

DENVER (KED).—Strike out all particulars.

EDWARD L. DOHENY.—Range, 150; system, Marconi, 300; service, PG; hours, X.

GEO. W. ELDER.—Range, 200; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

GRACE DOLLAR.—Strike out range; strike out system. Note, Grace Dollar Steamship Co., owner of vessel.

HONOLULU.—System, Marconi, 480.

ILLINOIS (KTH).—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Texas Steamship Co., owner of vessel.

INDEPENDENT.—Strike out system; strike out rates. Note, National Independent Fisheries Co., owner of vessel.

- J. A. CHANSLOR.**—Range, 200; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- J. A. MOFFETT.**—Range, 150; system, Marconi, 1000; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- J. M. GUFFEY.**—System, Marconi, 240; hours, X.
- JOHN D. ARCHBOLD.**—Range, 200; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New Jersey, owner of vessel.
- LARIMER.**—System, Marconi, 240; hours, X.
- LYDONIA.**—Range, 150; system, Marconi, 500; W. L., 300, 600; service, PG; hours, X; rate, 2 c. per word, 20 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. W. A. Lydon, owner of vessel (yacht).
- MATSONIA.**—System, Marconi, 480.
- MEXICANO.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Pierce Oil Corporation, owner of vessel.
- MOHAWK (KXE).**—System, Fessenden, 260; W. L., 300, 550, 600.
- MOHEGAN.**—System, Fessenden, 260; W. L., 300, 550, 600.
- NECHES.**—Range, 200; system, Marconi, 240; service, PG; hours, X; rates, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Mallory Steamship Co., owner of vessel.
- NORMAN BRIDGE.**—Range, 200; system, Marconi, 300; service, PG; hours, X.
- NORTH LAND (KJD).**—System, Marconi, 400.
- NUSHAQAK.**—Strike out system. Note, Alaska Packer's Association, owner of vessel.
- PARAISO.**—Range, 150; system, Marconi, 240; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Craig Shipbuilding Co., owner of vessel.
- PEQUONNOCK.**—System, Fessenden, 260; W. L., 300, 550, 600.
- PERFECTION.**—Range, 200; system, Marconi, 1000; service, PG; hours, X. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.
- PILOT BOY.**—Range, 100; system, Marconi, 400; service, PG; hours, 8m-11m, 2s-5s, 7s-8s; rates, 4c. per word, 40 c. minimum per radiogram.
- PLATURIA.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New Jersey, owner of vessel.
- PLYMOUTH.**—W. L., 300, 550, 600.
- PRINCETON (KST).**—Note, Standard Oil Co. of New Jersey, owner of vessel.
- PROVIDENCE.**—W. L., 300, 550, 600.
- RADIANT.**—Range, 200; system, Marconi, 1000; service, PG; hours, X.
- REDONDO.**—Strike out range; strike out system; strike out hours. Note, Alaska Steamship Co., owner of vessel.
- ROBERT DOLLAR.**—Strike out all particulars.
- SANTA CRUZ (WBD).**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SANTA MARIA (WTF).**—Strike out range; system, Poulsen arc; strike out rates. Note, United Steamship Co. (Union Oil Co.), owner of vessel.
- SANTA ROSALIA.**—Range, 200; system, Marconi, 480; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SANTIAGO.**—Range, 200; system, Marconi, 400; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.

- SATILLA.**—Range, 200; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Atlantic, Gulf, and West Indies Steamship Lines, owner of vessel.
- SHEBOYGAN.**—Strike out all particulars.
- SOMERSET (KSU).**—Note, Standard Oil Co. of New Jersey, owner of vessel.
- STANLEY DOLLAR.**—Strike out system. Note, Dollar Steamship Line, owner of vessel.
- STARR.**—System, Kilbourne & Clark. Note, Radio station operated and controlled by the San Juan Fishing and Packing Co., owner of vessel.
- ST. FRANCIS.**—Strike out system; strike out rates. Note, Libby, McNeill & Libby, owner of vessel.
- ST. HELENS.**—System, Marconi, 120; W. L., 300, 600; service, PG.
- ST. LOUIS (KSL).**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rates, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. International Mercantile Marine Co. (American Line), owner of vessel.
- TARRAGON.**—Strike out all particulars.
- UNITED STATES.**—Strike out all particulars.
- VENETIA.**—System, Marconi. Note, Radio station operated and controlled by J. D. Spreckels, owner of vessel (yacht).
- W. B. FLINT.**—Strike out system; strike out rates. Note, Libby, McNeill & Libby, owner of vessel.
- WILD DUCK.**—Range, 150; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Gulf Refining Co., owner of vessel (yacht).
- WILLAMETTE.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- W. S. PORTER.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KHK, read: Wahiawa, Hawaii (c). Strike out particulars following the call signals KED, KYV, NZZ, WBR, WFL, WIT, WLB, and WSM.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, only.]

- MEMPHIS, TENN. (5XC).**—W. L., 425 variable to 600.
- PITTSFIELD, MASS.**—W. L., 600, 1600 variable to 6000.
- TAKOMA PARK, MD.**—W. L., 500, 2000.

MISCELLANEOUS.

TRANSMISSION OF WEATHER REPORTS BY NAVAL RADIO STATIONS.

Through cooperation with local offices of the United States Weather Bureau, weather forecasts are sent broadcast to sea through naval coast radio stations at certain times, varying with the locality. Coast stations are generally prepared to give local forecasts to passing vessels without charge, on request. Storm warnings are sent whenever received and the daily weather bulletins are distributed by the naval radio stations at Arlington, Va., and Key West, Fla., a few minutes after the 10 p. m. time signal. These bulletins consist of two parts.

The first part contains code letters and figures which express the actual weather conditions at 8 p. m., seventy-fifth meridian time, on the day of distribution, at certain points along the eastern coast of North America, one point along the Gulf of Mexico, and one at Bermuda.

The second part of the bulletin contains a special forecast of the probable winds to be experienced a hundred miles or so off shore, made by the United States Weather Bureau, for distribution to shipmasters. The second part of the bulletin also contains warnings of severe storms along the coasts, as occasions for such warnings may arise.

Immediately following this bulletin, a weather bulletin for certain points along the Great Lakes is sent broadcast by the naval radio station at Arlington, Va., consisting of two parts. The first part contains code letters and figures which express the actual weather conditions at 8 p. m., seventy-fifth meridian time, on the day of distribution, at certain points along the Lakes. The second part of the bulletin contains a special forecast of the probable winds to be experienced on the Lakes, during the season of navigation—about April 15 to December 10.

The points for which weather reports are furnished are designated as follows: *For Atlantic coast and Gulf points*, S = Sydney, T = Nantucket, DB = Delaware Breakwater, H = Hatteras, C = Charleston, K = Key West, P = Pensacola, and B = Bermuda; *for points on the Great Lakes*, Du = Duluth, M = Marquette, U = Sault Ste. Marie, G = Green Bay, Ch = Chicago, L = Alpena, D = Detroit, V = Cleveland and F = Buffalo.

All bulletins begin with the letters U. S. W. B. (United States Weather Bureau) and the weather conditions follow. The first three figures of a report represent the barometric pressure in inches (002 = 30.02); the next figure, the fourth in sequence, represents the direction of the wind to the eight points of the compass: 1 = north, 2 = northeast, 3 = east, 4 = southeast, 5 = south, 6 = southwest, 7 = west, 8 = northwest and 0 = calm. The fifth figure represents the force of the wind on the Beaufort Scale, given below.

BEAUFORT SCALE OF WIND FORCE.

Number and designation.	Statute miles per hour.	Nautical miles per hour.
0 Calm.....	0 to 3	0 to 2.6
1 Light air.....	8	6.9
2 Light breeze.....	13	11.3
3 Gentle breeze.....	18	15.6
4 Moderate breeze.....	23	20.0
5 Fresh breeze.....	28	24.3
6 Strong breeze.....	34	29.5
7 Moderate gale.....	40	34.7
8 Fresh gale.....	48	41.6
9 Strong gale.....	56	48.6
10 Whole gale.....	65	56.4
11 Storm.....	75	65.1
12 Hurricane.....	90 and over.	78.1 and over.

In order to simplify the code, no provision has been made for wind force greater than 9, strong gale, on the Beaufort Scale. Whenever winds of force greater than 9 occur, the number representing them is given in words instead of figures, thus: Ten, eleven, etc.

EXAMPLES OF CODE.

U S W B S 96465 T 91674 DB 94686 H 99886 C 01214
K 02622 P 03613 B 00065

Translation.

United States Weather Bureau.

Station.	Pressure.	Wind.	
		Direction.	Force. ¹
Sydney.....	29.64	SW	5
Nantucket.....	29.16	W	4
Delaware Breakwater.....	29.46	NW	6
Hatteras.....	29.98	NW	6
Charleston.....	30.12	N	4
Key West.....	30.26	NE	2
Pensacola.....	30.36	N	3
Bermuda.....	30.00	SW	5

¹ See Beaufort Scale.

U S W B Du 95826 M 97635 U 00443 G 96046 Ch 95667
L 00644 D 00842 V 01054 F 01656

Translation.

United States Weather Bureau.

Station.	Pressure.	Wind.	
		Direction.	Force. ¹
Duluth.....	29.58	NE	6
Marquette.....	29.76	E	5
Sault Ste. Marie.....	30.04	SE	3
Green Bay.....	29.60	SE	6
Chicago.....	29.56	SW	7
Alpena.....	30.06	SE	4
Detroit.....	30.08	SE	2
Cleveland.....	30.10	S	4
Buffalo.....	30.16	S	6

¹See Beaufort scale.

NOTICE RELATIVE TO HANDLING OF OFFICIAL RADIOGRAMS BY NAVAL RADIO SERVICE.

When radiograms from ships other than naval vessels relating to official business of the United States (those having the word "Govt." preceding the address) are forwarded through naval radio shore stations, they will be transferred to forwarding lines without any further attempt to relay. These "Govt." messages include those addressed to the Weather Bureau or Observer.

In the case of all "Govt." messages originating on ships, Government or otherwise, in Alaskan waters, forwarded through naval radio shore stations, destined to points in the United States, they will be relayed by naval radio to North Head if for points outside of California, or to Eureka if for points in California, and there transferred to forwarding lines. The preceding applies where no routing instructions are given, but messages will be routed otherwise if so directed by the station of origin.

No charges will be made by the Naval Radio Service for the transmission of these "Govt." messages, but it will in all cases look to the station of origin for all forwarding charges at Government rates.

•
RADIO-SERVICE PERSONNEL.

V. Ford Greaves, radio engineer of the Bureau, is making a tour of inspection of the Pacific-coast districts.

Harry Sadenwater, of New York City, has been appointed as an assistant radio inspector in the office of the chief radio inspector at that port.

George B. MacMahon, clerk in the New York office, has been granted six months' leave without pay, on account of ill health, and is now on the Pacific coast.

CHANGE IN ARMY RATES.

The following changes in the ship and coast radio charges of the United States Army Radio Service, approved by the Secretary of War, will become effective on July 1, 1915:

The radio rate for stations of the United States Army Radio Service is six cents per word for shore stations and four cents per word for ship stations, ten-word minimum.

The charge, where the radio service is performed wholly between Army ship and shore stations, is, therefore, ten cents per word, and between two Army ship stations, eight cents per word.

COMMERCIAL EXTRA FIRST-GRADE OPERATORS.

The names of the following operators have been added to the list of those to whom commercial extra first-grade licenses have been issued by the Secretary of Commerce, as a reward for long and efficient service: Leo. F. Whitehead, Boston, Mass., and Walter John Lynch, New York, N. Y.

AMENDMENTS.

[To be cut out and pasted in your copy.]

The Radio Communication Laws of the United States, edition of July 27, 1914, are hereby amended as follows:

Paragraph 153, page 66, should read:

a. Renewal licenses may be issued to commercial grade operators without examination, provided the service records on the backs of licenses properly certify to three months' satisfactory commercial service during the last six months of the license term. If expired licenses have been lost or destroyed, an affidavit must be submitted attesting the facts regarding the manner in which the license was lost. In such cases, evidence of the required satisfactory commercial service may be submitted in the form of letters, signed by masters and employers.

b. Operators holding licenses of grades other than commercial, who submit satisfactory evidence to the examining officer, showing actual operation of radio apparatus for three months during the last six months of the license term, may be issued new licenses without examination. Otherwise, applicants for renewals will be examined in the usual manner.

c. Renewals or new licenses may be issued a reasonable length of time previous to the expiration of existing licenses, but must bear

the exact date of issue, which must correspond with the date on the back of Form 756 forwarded to the Commissioner of Navigation.

d. Operators who fail to apply for renewal of their licenses on or prior to the date of expiration must be reexamined. If, because of circumstances over which the applicant has no control, an operator is unable to apply for renewal of license on or prior to the date of expiration, an affidavit may be submitted to the Commissioner of Navigation through the radio inspector or examining officer, attesting to the facts, which will be considered by the Commissioner of Navigation, who will advise the radio inspector or examining officer in regard to the issue of a renewal of the license without reexamination.

e. Service records must be completed and signed only by masters, employers, or the duly authorized agents of either.

f. Any improper alteration of the service record, or the forgery of masters' or employers' signatures, constitute a violation of the regulations, and the operator may suffer suspension of license for a period not exceeding one year, at the discretion of the Secretary of Commerce.

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JUN 30 1915

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, June, 1915—No. 6

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States, and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the list of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

95717—15

ABBREVIATIONS.

INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.

Nature of service:

PG=General public.

PR=Limited public.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in cents. (The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refers to notes in the Berne list.

Co. =Company.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Akutan, Alaska ¹		KMW			
Albina, Oreg. ²		KGN			
Egegak, Alaska ³ , ⁴	O 167 39 00	KMF	100-300	Composite, 300	300, 600
	N 58 17 00				
Nushagak, Alaska (KMG) ⁵ , ⁶	O 168 32 00	KMG	100-300	Composite, 300	300, 600
	N 58 42 00				
Roche Harbor, Wash. ⁷		KRW			
Seattle, Wash. (KPE) ⁸ , ⁹	O 122 20 00	KPE	50	Composite, 150	300, 525, 600
	N 47 37 00				
Underwood, Wash. ²		KGO			

¹ Radio station operated and controlled by the North Pacific Sea Products Co.² Radio station operated and controlled by the Northwestern Electric Co.³ The station has private service, with no regular hours.⁴ Radio station operated and controlled by the North Alaska Salmon Co. The station is limited to correspondence with ship and land stations of the North Alaska Salmon Co.⁵ Radio station operated and controlled by the Tacoma & Roche Harbor Lime Co.⁶ Service, PR; hours, 8m-5s, except Sundays and holidays.⁷ Radio station operated and controlled by the city of Seattle (harbor department). The station corresponds with the harbor patrol boats and all vessels entering Puget Sound.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Service.	Hours.
Achilles.....	KPT		300, 600		
Costa Rica ^{1, 2, 3}	WQI	Composite, 480.....	300, 600	PG	N
Edith ^{2, 4, 5}	WAE	Kilbourne & Clark, 120....	300, 600	PG	X
Matinickock ⁶	KID		300, 600		
Restorer ^{4, 7, 8}	WIU	Marconi.....	300, 600	P	N
San Mateo ⁹	KLV		300, 600		
San Pablo ¹⁰	KLW		300, 600		
San Pedro ¹¹	KLX		300, 600		
Santa Catalina ^{4, 7, 12, 13}	WBC	Marconi, 480.....	300, 600	PG	X
Sarnia ^{7, 12, 14, 15}	KVR	Marconi, 240.....	300, 600	PG	N
Seward ^{2, 4, 5}	WAV	Kilbourne & Clark, 120....	300, 600	PG	X
Siberia ¹⁶	KVS	Marconi.....	300, 600		
Standard ⁶	KIC				
Victoria ^{2, 4, 5}	WAD	Kilbourne & Clark, 120....	300, 600	PG	N

¹ Range, 500 miles.

² Rates, 4 c. per word, 40 c. minimum per radiogram.

³ Radio station operated and controlled by the Bristol Bay Packing Co., owner of vessel.

⁴ Range, 100 miles.

⁵ Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.

⁶ Standard Oil Co. of New Jersey, owner of vessel.

⁷ Rates, North and South American service 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

⁸ Radio station operated and controlled by the Commercial Pacific Cable Co., owner of vessel.

⁹ San Mateo Steamship Corporation, owner of vessel.

¹⁰ San Pablo Steamship Corporation, owner of vessel.

¹¹ San Pedro Steamship Corporation, owner of vessel.

¹² Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

¹³ Atlantic & Pacific Steamship Co., owner of vessel.

¹⁴ Range, 200 miles.

¹⁵ Sarnia Steamship Corporation, owner of vessel.

¹⁶ Siberia Steamship Corporation, owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; c—land station.]

Call signal.	Station.	Call signal.	Station.
KGN	Albina, Oreg.....c	KPT	Achilles.....b
KGO	Underwood, Wash.....c	KRW	Roche Harbor, Wash.....c
KIC	Standard.....b	KVR	Sarnia.....b
KID	Matinickock.....b	KVS	Siberia.....b
KLV	San Mateo.....b	WAD	Victoria.....b
KLW	San Pablo.....b	WAE	Edith.....b
KLX	San Pedro.....b	WAV	Seward.....b
KMF	Egegak, Alaska.....c	WBC	Santa Catalina.....b
KMG	Nushagak, Alaska.....c	WIU	Restorer.....b
KMW	Akunat, Alaska.....c	WQI	Costa Rica.....b
KPE	Seattle, Wash.....c		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Algon, Wash.....	7XU	300, 600, 4000 variable..	P	X	Universal High Power Telephone Co.
Grand Coteau, La.....	5ZQ	450.....	P	X	St. Charles College.
Ithaca, N. Y.....	8YC	300, 425.....	P	X	Cornell University.
Lawrence, Kans.....	9XP	400, 550, 800, variable..	P	X	University of Kansas.
Pittsburgh, Pa.....	8YI	300, 425.....	P	X	University of Pittsburgh.
Providence, R. I.....	12P	200, 300, 425, 600.....	P	X	Ralph C. Watrous.
Rockland, Me.....	12R	200, 300, 450, 600.....	P	X	Edward L. Norton.
Seattle, Wash. (7XK)...	7XK	600, 1000, 1400, 2000, 4000, variable.	P	X	Kilbourne & Clark Mfg. Co.
Seattle, Wash. (7XM)...	7XM	300, 600, 1400, variable.	P	X	Wireless Instrument Co.
Worcester, Mass.....	12W	200, 425.....	P	X	Wm. H. Allison.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1ZP	First district:	7XM	Seventh district—Continued:
1ZR	Providence, R. I.	7XU	Seattle, Wash.
1ZW	Rockland, Me.		Algona, Wash.
	Worcester, Mass.		Eighth district:
5ZQ	Fifth district:	8YC	Ithaca, N. Y.
	Grand Coteau, La.	8YI	Pittsburgh, Pa.
7XK	Seventh district:	9XP	Ninth district:
	Seattle, Wash.		Lawrence, Kans.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ELLAMAR, ALASKA.—Strike out all particulars.

FRIDAY HARBOR, WASH.—Strike out all particulars.

JUALIN, ALASKA.—Strike out all particulars.

MARSHFIELD, OREG.—Range, 250; system, Marconi, 240; W. L., 300, 600.

NEWPORT (WCI), R. I.—Range, 75; system, Fessenden, 1000; W. L., 300, 550, 600; rates, vessels plying between ports within 200 miles of New York, N. Y., 3 c. per word, 30 c. minimum per radiogram; North and South American service, 6 c. per word, 60 c. minimum per radiogram; transoceanic service, 12 c. per word, \$1.20 minimum per radiogram.

NEW YORK (WHD), N. Y.—Strike out all particulars.

PASSAGRILLE, FLA.—Ship rate, 6 c. per word, cable count, no minimum.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ADMIRAL DEWEY.—Range, 100; system, Kilbourne & Clark, 120.

ADMIRAL FARRAGUT.—Range, 100; system, Kilbourne & Clark, 120.

ADMIRAL SCHLEY.—Range, 100; system, Kilbourne & Clark, 120.

ADMIRAL WATSON.—Hours, X.

ALAMEDA.—Range, 100; system, Kilbourne & Clark, 120; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.

ALOHA.—Range, 200; system, Marconi, 1000; W. L., 300, 600; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Arthur Curtiss James, owner of vessel (yacht).

AMERICAN.—Hours, X.

ANTILLA.—Range, 200; system, Marconi, 400; service, PG; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.

ATLANTIC CITY.—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; rate, 4 c. per word, 40 c. minimum per radiogram.

BANTU.—Range, 200; system, Marconi, 400; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram.

BATON ROUGE.—Range, 200; system, Telefunken, 1000; service, PG; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.

BAYAMON.—Strike out all particulars.

BAYWAY.—Range, 200; system, Telefunken, 1000; service, PG; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.

- BELFAST.**—System, Marconi, 400.
- BERLIN.**—Range, 100; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- BEVERLY.**—Range, 50; system, Fessenden, 260; service, PG; hours, N; rate, 3 c. per word, 30 c. minimum per radiogram. Notes, Radio station operated and controlled by the National Electric Signaling Co. Colonial Navigation Co., owner of vessel.
- BORINQUEN.**—Strike out all particulars.
- BRABANT.**—System, Marconi, 240; rate, 4 c. per word, 40 c. minimum per radiogram.
- BROCKTON.**—Range, 50; system, Fessenden, 260; service, PG; hours, N; rate, 3 c. per word, 30 c. minimum per radiogram. Notes, Radio station operated and controlled by the National Electric Signaling Co. Colonial Navigation Co., owner of vessel.
- CALIFORNIA (KYQ).**—Range, 200; system, Marconi, 240; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Mrs. Clara B. Stocker, owner of vessel (yacht).
- CALORIA.**—Range, 200; system, Marconi, 480; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- CHARLTON HALL.**—Range, 200; system, Marconi, 240; service PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- CHICAGO (WAC).**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X.
- CHINA.**—System, Marconi, 120; W. L., 300, 600; service, PG. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Pacific Mail Steamship Co., owner of vessel.
- CHIPPewa (WBH).**—Strike out all particulars.
- CITY OF MACON.**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- CITY OF MEMPHIS.**—System, Marconi, 400; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- CITY OF PANAMA.**—Strike out all particulars.
- CITY OF SEATTLE.**—Range, 100; system, Marconi, 480; W. L., 300, 600; service, PG; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- COL. JAMES M. SCHOONMAKER.**—Strike out all particulars.
- COLUMBIA (WPW).**—Strike out all particulars.
- CRASTER HALL.**—Range, 200; system, Marconi, 240; service, PG; hours, X. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. U. S. Steel Products Co., owner of vessel.
- CROFTON HALL.**—Range, 200; system, Marconi, 120; service, PG; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- C. W. MORSE.**—Strike out all particulars.
- CYPRUS.**—Range, 200; system, Marconi, 1000; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- DAMARA.**—System, Marconi, 240.
- DELHI.**—Strike out all particulars.
- DESPATCH.**—Range, 150; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- DIRIGO.**—Strike out all particulars.
- DOLPHIN (WAU).**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, N. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- EVANGELINE.**—Range, 200; system, Marconi, 120; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- EXPLORER.**—Range, 150; system, Telefunken; hours, N. Notes, Radio station operated and controlled by the United States Department of Commerce, Coast and Geodetic Survey. Surveying ship.

F. A. KILBURN.—System, Marconi, 400.

FORWARD (KPF).—Range, 50; system, Fessenden, 260; W. L., 300, 450, 500, 550, 600; service, PG; hours, N; rate, 6 c. per word, 60 c. minimum per radiogram.

Notes, Radio station operated and controlled by the National Electric Signaling Co. Yankee Salvage Association, owner of vessel.

GENL. PETTIBONE.—Strike out all particulars.

GLORY OF THE SEAS.—Strike out all particulars.

GOLIAH.—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Puget Sound Tug Boat Co., owner of vessel.

GOVERNOR DINGLEY.—System, Marconi, 400.

GRAYSON.—Strike out all particulars.

GUANTANAMO.—Range, 200; system, Marconi, 400; service, PG; hours, N; rate 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. New York & Cuba Mail Steamship Co. (Ward Line) owner of vessel.

GULFOIL.—System, Marconi, 480; hours, X.

HAWAIIAN.—Range, 200; system, Telefunken, 1000; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

HOWICK HALL.—Range, 200; system, Marconi, 240; service, PG; hours, N.

HUMBOLDT.—Range, 100; W. L., 300, 600; service, PG; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

HYADES.—Range, 140; system, Marconi, 480; W. L., 300, 600; service, PG.

I. D. FLETCHER.—Range, 200; system, Marconi, 400; W. L., 300, 600; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Coast Transit Co., owner of vessel.

I. J. MERRITT.—Range, 100; system, Clapp-Eastham, 500; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Merritt & Chapman Derrick & Wrecking Co., owner of vessel.

IOWAN.—Hours, X.

IROQUOIS (WBG).—Strike out all particulars.

JAMES DUANE.—Strike out all particulars.

JEFFERSON (WAJ).—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.

JIM BUTLER.—Range, 150; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Olson & Mahony, owner of vessel.

J. L. LUCKENBACH.—Range, 200; system, Marconi, 240; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram.

JOHN D. ROCKEFELLER.—Range, 300; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

JOSEPH PULTZER.—Strike out all particulars.

KANSAN.—Range, 200; system, Telefunken, 1000, W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

KENTRA.—Range, 200; system, Marconi, 400; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram.

KENTUCKIAN.—Range, 200; system, Telefunken, 1000; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

KROONLAND.—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

KVICHAK.—Range, 300; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Packers' Association, owner of vessel.

LATOCHE.—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.

- I EELANAW.**—System, Marconi, 120; W. L., 300, 600; service, PG; Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Harris, Irby & Vose, owner of vessel.
- LLAMA.**—Range, 200; system, Marconi, 240; service, PG; hours, N.
- MACKINAW.**—Strike out all particulars.
- MARACAS.**—Range, 200; system, Marconi, 400; service, PG; hours, N; rate, 8 c. per word, 80 c. minimum per radiogram.
- MARIPOSA.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- MAVERICK.**—Strike out system. Note, Standard Oil Co. of California, owner of vessel.
- MILLS.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG., hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Ogden Mills, owner of vessel.
- MINNESOTA.**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- MONTANAN.**—Range, 200; system, Telefunken, 1000; W. L., 300, 600; service PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- NACOOCHIE.**—System, Marconi, 400; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- NIAGARA (KYN).**—Range, 200; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Howard Gould, owner of vessel (yacht).
- NOKOMIS.**—System, Marconi. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Horace E. Dodge, owner of vessel (yacht).
- NOMA.**—Range, 200; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Vincent Astor, owner of vessel (yacht).
- NORTH LAND (KJD).**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- NORTH STAR (KJS).**—System, Marconi, 400; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- NORTH STAR (WHR).**—Strike out all particulars.
- NORTHWESTERN (WAN).**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, N. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- NUSHAGAK.**—Range, 300; system, Kilbourne & Clark, 120; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Packers' Association, owner of vessel.
- OHTOAN.**—Hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- OLD COLONY.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Eastern Steamship Corporation, owner of vessel.
- OLIVER J. OLSON.**—Strike out all particulars.
- ONEONTA.**—Range, 100; system, Marconi, 1000; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- OREGONIAN.**—Range, 200; system, Telefunken, 1000; hours, X; rates North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- OSSABAW.**—Range, 250; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Atlantic, Gulf & West Indies Steamship Lines (Mallory Steamship Co.) owner of vessel.

- OWERA.**—Range, 200; system, Marconi, 1000; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- PANAMAN.**—Range, 200; system, Telefunken, 1000; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- PANUCCO.**—Range, 200; system, Marconi, 240; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram.
- PATHFINDER.**—Range, 150; system, Telefunken; W. L., 300, 600; service, O; hours, N. Notes, Radio station operated and controlled by the United States Department of Commerce, Coast and Geodetic Survey. Surveying ship.
- PATTERSON (NLH).**—Range, 150; system, Telefunken; hours, N. Notes, Radio station operated and controlled by the United States Department of Commerce, Coast and Geodetic Survey. Surveying ship.
- PAVLOF.**—Range, 100; system, Marconi, 480; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- PENNSYLVANIAN.**—Range, 200; system, Telefunken, 1000; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- PETROLITE.**—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m-12m, 2a-5a, 8a-10:30a; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
- PILOT BOY.**—Strike out system. Note, Texas & Gulf Steamship Co., owner of vessel.
- PIONEER.**—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m-12m, 2a-5a, 8a-10:30a; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
- PLATURIA.**—Range, 200; system, Marconi, 240; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram.
- POLARINE.**—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m-12m, 2a-5a, 8a-10:30a; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
- PRINCETON (KST).**—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m-12m, 2a-5a, 8a-10:30a; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Standard Oil Co. of New Jersey, owner of vessel.
- REDONDO.**—Range, 100; system, Kilbourne & Clark, 120; hours, X. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- RESCUE.**—Range, 100; system, De Forest, 240; W. L., 300, 600; service, PG; hours, X; rate, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Merritt & Chapman Derrick & Wrecking Co., owner of vessel.
- REUCE.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X. Note, Radio station operated and controlled by the Columbia River Packers' Association, owner of vessel.
- SAMSON (WOS).**—Strike out all particulars.
- SAN FRANCISCO (KRT).**—Range, 200; system, Marconi, 480; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SAN JUAN (KGJ).**—System, Marconi, 400.
- SAN MARCOS.**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SANTA ANA.**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, N. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- SANTA CECILIA.**—Range, 100; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. per radiogram.

- SANTA MARTA.**—Range, 500; system, Composite, 1000; service, PG; hours, N; rate, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated controlled by the Tropical Radio Telegraph Co. Santa Marta Steamship Corporation, owner of vessel.
- SARAMACCA.**—Range, 350; system, Wireless Specialty Apparatus Co., 1000; service, PG; hours, N; rate, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Saramacca Steamship Corporation, owner of vessel.
- SATSUMA.**—Range, 200; system, Marconi, 480; service, PG; hours, N; rate, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co., of America. Barber & Co., owner of vessel.
- SECURITY.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X.
- SENATOR.**—Range, 100; system, Marconi, 480; W. L., 300, 600; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SENATOR BAILEY.**—W. L., 300, 450, 600; hours, X.
- SHENANGO (KTC).**—System, Marconi, 240; hours, X.
- SHENANGO (WET).**—Strike out all particulars.
- SIBERIA.**—System, Marconi, 300.
- SOMERSET (KSU).**—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m-12m, 2s-5s; 8s-10.30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
- SPOKANE.**—Range, 100; system, Marconi, 480; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- STARR.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X.
- ST. FRANCIS.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Alaska Fishermen's Packing Co., owner of vessel.
- ST. NICHOLAS.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X. Note, Radio station operated and controlled by the Columbia River Packers' Association, owner of vessel.
- SULTANA.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Mrs. Mary W. Harriman, owner of vessel (yacht).
- SURINAME.**—Range, 350; system, Wireless Specialty Apparatus Co., 1000; service, PG; hours, N; rate, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Suriname Steamship Corporation, owner of vessel.
- S. V. LUCKENBACH.**—Range, 200; system, Marconi, 400; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram.
- TATOOSH.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X.
- TEXAN.**—Range, 250; system, Telefunken, 1000; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- TOPLA.**—System, Marconi, 480; hours, X.
- TYEE JUNIOR.**—Strike out all particulars.
- WAKIVA.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Lamson V. Harkness, owner of vessel (yacht).
- WALLULA.**—Range, 100; system, Marconi, 1000; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- WAPAMA.**—Range, 100; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Chas. R. McCormick & Co., owner of vessel.

- W. B. FLINT.—Range, 100; system, Kilbourn & Clark, 120; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Fishermen's Packing Co., owner of vessel.
- W. B. KEENE.—Range, 200; system, Marconi, 400; service, PG; hours, X.
- WICO.—Range, 200; system, Marconi, 480; service, PG; hours, X.
- WILLIAM P. SNYDER.—Strike out all particulars.
- WILLIAM P. SNYDER, JR.—Strike out all particulars.
- WILPEN.—Strike out all particulars.
- WINDBER.—Range, 100; system, Marconi, 480; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- ZAPORA.—Range, 100; system, Kilbourn & Clark, 120; W. L., 300, 600; service, PG; hours, X. Note, Radio station operated and controlled by the International Fisheries Co., owner of vessel.
- ZARA.—Range, 200; strike out system; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, F. J. Littlefield, owner of vessel (yacht).

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out particulars after the following call signals: KDV, KDW, KDX, KIJ, KIS, KJA, KMO, KPD, KUP, WAO, WBG, WBH, WBZ, WEQ, WER, WES, WET, WEU, WGD, WHD, WHR, WHW, WNB, WOS, WPB, WPW, WPZ, WWP.

MISCELLANEOUS.

RATES.

The Marconi Wireless Telegraph Co. of America has been authorized by the Department to apply a rate of \$1.25 for 10 words and 12 c. for each additional word, domestic count, for commercial business between its stations at Astoria, Oreg., and Ketchikan, Alaska. These stations will also apply a ship rate of 6 c. per word for North and South American service and 12 c. per word for transoceanic service, the foregoing rates to be effective June 1, 1915.

The Department has approved the reestablishment of the rate of 6 c. per word for limited public service between the Marconi station at Miami, Fla., and the British Government station at Nassau, Bahamas, effective June 1, 1915. The Department authorized an increase in this rate to 12 c. per word, effective March 15, 1915, and the 6 c. rate has been reestablished at the request of the Marconi Co.

COMMERCIAL EXTRA FIRST-GRADE OPERATORS.

The name of Fred Elmer Nickel, of San Francisco, Cal., has been added to the list of those to whom commercial extra first-grade licenses have been issued by the Secretary of Commerce as a reward for long and efficient service.

LIST OF RADIO STATIONS OF THE UNITED STATES.

The owners of all radio stations, other than general and restricted amateur, are requested to forward to the radio inspector of their districts any changes in their stations and information as to the dismantling of stations or the erection of new stations, in order that these changes may be included in the List of Radio Stations of the United States, edition of July 1, 1915, and the bureau's records brought up to date.

NOME, ALASKA, SUMMER SCHEDULE.

The following summer-operating schedule will be maintained by the Signal Corps radio station at Nome, Alaska (Nome time), during the months of July, August, and September:

DAILY.

NULATO.—9 a. m., 11 a. m., 3 p. m., 5 p. m., 7.45 p. m.

ST. MICHAEL.—10 a. m., 2 p. m., 6 p. m., 7 p. m.

ST. PAUL.—8.30 a. m., 4 p. m.

SUNDAYS AND HOLIDAYS.

NULATO.—9 a. m., 5 p. m.

ST. MICHAEL.—10 a. m., 6 p. m.

DAILY.

Schedule after 8 p. m. fixed by Nulato to clear the line east. This sometimes takes to midnight and after.

The time not covered above will be available for ships night and day and for St. Paul, but it should be thoroughly understood that the stations mentioned will clear before surrendering.

AMENDMENTS.

[To be cut out and pasted in your copy.]

The Radio Communication Laws of the United States, edition of July 27, 1914, are hereby amended as follows:

Page 56, paragraph 71, should read:

In order to comply with section 2 of the act of July 24, 1910, every land station open to general public service, and every station on board an American vessel of the first or second class engaged in the foreign trade or transoceanic service, shall have as a part of the station equipment a copy of the official Berne list and supplements thereto as issued. Information concerning the use of this list and method of procuring it is given on page 72, paragraph 196.

Page 72, Paragraph 193, should read:

Supplements to this list are issued monthly under the title "Radio Service Bulletin," and the list is revised annually as of July 1. These monthly supplements contain information concerning Government, commercial, and special stations only, and information regarding amateur stations appears only in the annual edition of the list of Radio Stations of the United States. Amendments to or changes in the Radio Laws and Regulations of the United States are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication. Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

Page 72, paragraph 195, should read:

A copy of the official Berne list, and supplements as issued, are required as a part of the equipment of every land station open to general public service and every ship station of the first or second class on American vessels engaged in foreign trade or the transoceanic service.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, July, 1915—No. 7

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States, and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the list of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.

INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.

Nature of service:

PG=General public.

PR=Limited public.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

c=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation:

Rates =Ship or coast charges in cents. (The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refers to notes in the Berne list.

Co. =Company.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Darien, Panama ^{1,2}	O 79 46 40 N 9 07 20	NBA	1,000	U. S. Navy.....	.....
Iditarod, Alaska ^{3,4}	O 156 37 00	KIV	200	Telefunken.....	500
Kvichak, Alaska (KMT) ^{5,6}	N 59 08 00	KMT	500	Composite, 500..	300, 600, 2,000
Teller, Alaska ⁷.....	.....	KWT	.....	.....	.....

¹ Radio station operated and controlled by the United States Naval Radio Service, Radio, Va.² Service, O; hours, N.³ Radio station operated and controlled by the Alaska Wireless Telegraph Co.⁴ The station is limited to correspondence with the United States Signal Corps station at Nulato, Alaska; hours, 9m-7s.⁵ Radio station operated and controlled by the North Alaska Salmon Co.⁶ The station is limited to correspondence with ship and shore stations of the North Alaska Salmon Co.; hours, X.⁷ Radio station operated and controlled by Max R. Hirschberg.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	Wave lengths.	Owner of vessel.
Communipaw.....	KOE	300, 600	Standard Oil Co. of New Jersey.
Glenpool.....	KOH	300, 600	Do.
Oregon (WOU) ¹	WOU		Crowley Launch & Tugboat Co.
Richard.....	WLG	300, 600	Richard Hulett & Son.
S. M. Fischer ¹	WPH		Reid Wrecking Co.
Wahama.....	KZW		W. W. Campbell (yacht).

¹ System, Marconi.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Station.	Call signal.	Station.
KIV	Iditarod, Alaska.....c	KZW	Wahama.....b
KMT	Kvichak, Alaska.....c	NBA	Darlen, Panama.....c
KOE	Communipaw.....b	WLG	Richard.....b
KOH	Glenpool.....b	WOU	Oregon.....b
KWT	Teller, Alaska.....c	WPH	S. M. Fischer.....b

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, only.]

Name.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Aldene, N. J.....	2XL	300, 600, 1800.....	P	X	Marconi Co.
Chicago, Ill.....	9YH	335, 600.....	P	X	Frank S. Jones.
Denver, Colo. (9ZA).....	9ZA	450, 500, 750.....	P	X	Co. A, Signal Corps, Colorado National Guard.
Lake Geneva, Wis. (9YW).....	9YW	300, 425.....	P	X	Northwestern Military and Naval Academy.
Lake Geneva, Wis. (9YX).....	9YX	300, 425.....	P	X	Do.
Madison, Wis.....	9XM	2000, 2200.....	P	X	University of Wisconsin.
New York, N. Y. (2XG).....	2XG	300, 350, 600, 850, 1800, 2500.....	P	X	Radio Telephone & Telegraph Co.
New York, N. Y. (2YS).....	2YS	250, 300, 600.....	P	X	William S. Wilson.
Port Chester, N. Y.....	2ZP	200, 425, 600.....	P	X	John W. Hubbard.
San Francisco, Cal. (6XD).....	6XD	300, 600, 2500, 3000.....	P	X	Dwyer Wireless Telephone & Telegraph Co.
Trinidad, Colo.....	9ZB	450, 600, 750.....	P	X	Co. A, Signal Corps, Colorado National Guard.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
2XG	Second district:	9XM	Ninth district:
2XL	New York, N. Y.	9YH	Madison, Wis.
2YS	Aldene, N. J.	9YW	Chicago, Ill.
2ZP	New York, N. Y.	9YX	Lake Geneva, Wis.
6XD	Port Chester, N. Y.	9ZA	Do.
	Sixth district:	9ZB	Denver, Colo.
	San Francisco, Cal.		Trinidad, Colo.

ALTERATIONS AND CORRECTIONS.**LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.**

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ASTORIA, OREG.—Range, 250–1500; system, Marconi, 480; W. L., 300, 600, 1800, 3100. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The long wave lengths are used for limited public service with Ketchikan, Alaska; rates, for commercial business, \$1.25 for 10 words (10 word minimum) and 12 c. for each additional word, domestic count. For press dispatches, 3 c. per word.

HEEIA POINT, HAWAII.—Notes, Radio station operated and controlled by the Federal Telegraph Co. The station is reserved for correspondence with a land station at South San Francisco, Cal.; rates, regular messages, 25 c. per word, cable count, no minimum. Night lettergrams, plain English, cable count, code address allowed, 13 words minimum including prefix, \$1. Each additional word, 8 c. Week-end letters, plain English, cable count, code address allowed, 25 word minimum including prefix, \$1.50. Each additional word, 6 c.

JUNEAU, ALASKA.—Range, 250–1500; system, Marconi, 480; W. L., 300, 600, 1800, 3100; service, PG; hours, N; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram, transoceanic service, 12 c. per word, \$1.20 minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The long wave lengths are used for limited public service with Ketchikan, Alaska; rates, 50 c. for 10 words (10 word minimum) and 5 c. for each additional word, domestic count.

JUPITER, FLA.—Strike out W. L., service, O.

KETCHIKAN, ALASKA.—Range, 250–1500; system, Marconi, 480; W. L., 300, 600, 1800, 3100; service, PG; hours, N; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram, transoceanic service, 12 c. per word, \$1.20 minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The long wave lengths are used for limited public service with Astoria, Oreg.; rates, for commercial business, \$1.25 for 10 words (10 word minimum) and 12 c. for each additional word, domestic count. For press dispatches, 3 c. per word. The station also communicates with Juneau, Alaska, rates, 50 c. for 10 words (10 word minimum) and 5 c. for each additional word, domestic count.

MIAMI, FLA.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The station also exchanges correspondence with Nassau (Bahamas); rate, 6 c. per word, no minimum.

SOUTH SAN FRANCISCO, CAL.—Notes, Radio station operated and controlled by the Federal Telegraph Co. The station is reserved for correspondence with a land station at Heeia Point (near Honolulu), Hawaii; rates, regular messages, 25 c. per word, cable count, no minimum. Night lettergrams, plain English, cable count, code address allowed, 13 words minimum including prefix, \$1. Each additional word 8 c. Week-end letters, plain English, cable count, code address allowed, 25 word minimum including prefix, \$1.50. Each additional word 6 c.

TAMPA, FLA.—Hours, 7m–10s.

UNALGA, ALASKA.—Strike out all particulars.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

BUNKER HILL.—Range, 200; system, Marconi, 400; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Eastern Steamship Corporation, owner of vessel.

CADDO.—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m–4s, 8s–12s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.

- CITY OF ATLANTA.**—System, Marconi, 400; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- CITY OF CHICAGO.**—Name, City of St. Joseph.
- COALINGA.**—Range, 400; system, Poulsen arc; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Federal Telegraph Co. Union Steamship Co. (Union Oil Co.), owner of vessel.
- DAKOTAN.**—Hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- DAMARA.**—Name, Florence Luckenbach.
- DOROTHY BRADFORD.**—Strike out range; strike out system. Note, Cape Cod Steamship Co., Trustees, owner of vessel.
- GRACE DOLLAR.**—System, Marconi. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Grace Dollar Steamship Co., owner of vessel.
- GREENWOOD.**—Strike out all particulars.
- INDEPENDENT.**—Strike out all particulars.
- KANSAS CITY.**—Strike out all particulars.
- LUCY NEFF.**—Strike out all particulars.
- LUNDIN POWER LIFEBOAT.**—Name, Lundin; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Welin Marine Equipment Co., owner of vessel.
- LYMAN STEWART.**—Range, 400; system, Poulsen arc; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Federal Telegraph Co. Union Oil Co. of California, owner of vessel.
- MISSOURIAN.**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- MORENI.**—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m—12m, 2s—5s, 8s—10:30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
- NOKOMIS.**—Range, 100; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, 2 c. per word, 20 c. minimum per radiogram.
- NORTH STAR (KYZ).**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Cornelius Vanderbilt, owner of vessel (yacht).
- PRISCILLA.**—System, Fessenden, 260; W. L., 300, 550, 600.
- RESTORER.**—System, Composite, 480; W. L., 250, 300, 600.
- ROCHELLE.**—Strike out all particulars.
- SANTA CLARA (KIR).**—Strike out all particulars.
- SANTA RITA (WTG).**—System, Marconi; W. L., 300, 600. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Sun Co., owner of vessel.
- SAVAGE (KRS).**—Strike out all particulars.
- SEA OTTER.**—Strike out all particulars.
- SEMINOLE (KVJ).**—Strike out all particulars.
- SEWARD.**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SIBIRIA.**—Range, 150; system, Marconi, 250; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Sibiria Steamship Corporation (Atlantic Fruit Co.) owner of vessel.
- SIXAOILA.**—Range, 500; system, Wireless Specialty Apparatus Co., 1000; service, PG; hours, N; rates, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Sixaóla Steamship Corporation, owner of vessel.

SULTANA.—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
 WINONA.—Strike out all particulars.
 WOODBURY.—Strike out all particulars.
 ZEALANDIA (KNR).—Range, 200; system, Fessenden, 1000; W. L., 300, 600; service, PG; hours, X; rates, 4 c. per word, 40 c. minimum per radiogram. Notes. Radio station operated and controlled by the National Electric Signaling Co. Fiske Trading Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

WDT, read: City of St. Joseph (b); WNM, read: Florence Luckenbach (b). Strike out particulars following the call signals KIR, KNQ, KRS, KVJ, KYS, NPV, NRJ, NRV, WNR, WPI, WQG, WWS.

MISCELLANEOUS.

PANAMA-PACIFIC INTERNATIONAL EXPOSITION.

The Bureau's radio exhibit at the Panama-Pacific International Exposition has been awarded a silver medal for the educational demonstration of methods and apparatus for the enforcement of the Federal radio laws. This exhibit consists of all the necessary instruments used by radio inspectors in the inspection of radio equipment—a model ship set and a model amateur set.

It has been reported to the Bureau that signals from the Eilvese station in Germany have been received at the Bureau's station, and time signals are received daily from the Mare Island Navy Yard station sufficiently audible to allow visitors to set their watches at a distance of 30 feet from the radio receiver, and considerable interest has been manifested in these two features of the exhibit.

A radio inspector is in charge of the exhibit at all times to demonstrate the method of inspection, to give information concerning the radio laws and regulations to owners and masters of vessels, operators and amateurs, and to distribute the Department's publications concerning the radio laws and regulations. The inspector in charge is prepared to conduct examinations of applicants for radio operator licenses.

COMMERCIAL OPERATOR FINED.

A commercial radio operator of New York City was reported by the radio inspector of that district for changing his second-grade commercial operator's license to resemble a first-grade license and obtaining employment as a first-grade operator. The case was reported to the United States district attorney for prosecution, and upon pleading guilty to a charge of forgery the operator was fined \$25 by Judge Grubb, of the United States district court.

GENERAL STATISTICS OF THE INTERNATIONAL BUREAU FOR 1913.

Copies of the General Statistics of Radiotelegraphy for the year 1913 may be procured from the International Bureau of the Telegraph Union, Radiotelegraphic Service, Berne, Switzerland, at 30 centimes (6 cents) per copy, postage extra.

RADIO SERVICE PERSONNEL.

Benjamin E. Wolf, radio inspector in charge of the Bureau's exhibit at the Panama-Pacific International Exposition, has been placed in charge of the Seattle office and Ellery W. Stone, assistant radio inspector at San Francisco, has been detailed to the exposition as the Bureau's representative. William F. Macomber has been appointed as an assistant radio inspector at San Francisco.

R. D. Duncan, jr., assistant radio inspector at New York, has been transferred to the Bureau of Standards.

UNITED STATES NAVAL RADIO SERVICE CHANGES.

The Jupiter (Fla.) station of the United States Naval Radio Service has been closed to commercial traffic. Government messages and position reports will be accepted through that station.

The Unalga (Alaska) station of the United States Naval Radio Service has been discontinued and service may be obtained through the Dutch Harbor station instead.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, August, 1915—No. 8

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E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

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- Rates =Ship or coast charges in cents. (The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
- Notes =Refers to notes in the Berne list.
- Co. =Company.

NOTICE.

It will be noted that the additions, alterations, and corrections contained in this bulletin apply to the List of Radio Stations of the United States, edition of July 1, 1914.

The additions, alterations, and corrections which will appear in the October issue of this bulletin will be supplementary to the List of Radio Stations of the United States, edition of July 1, 1915, which is now in the hands of the printer, although it is not possible at this time to anticipate its delivery. All additions, alterations, and corrections appearing in the October and later editions of this bulletin should be saved and inserted in the new annual list as soon as it is received.

A sufficient number of blank pages will be inserted in the back of the new list in order that the additions appearing in the bulletins may be clipped and pasted therein, enabling operators and others concerned to keep their annual list up to date with very little trouble.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Fort Adams, R. I. ^{1,2}		WUU	125	U. S. Army, 500.	1200
Jualin, Alaska ³		KJA		Marconi.....	
Portland, Oreg. (KDP) ^{4,5}	O 122 42 30	KDP	150	Composite, 450..	300, 550, 600
	N 45 30 45				
Portland, Oreg. (KGN) ^{5,6}	O 122 41 00	KGN	150	Composite, 400..	300, 600, 1700
	N 45 32 00				
Rialto, Cal. ⁷	O 117 26 53	KJR	250	Massie, 200.....	300, 600, 1610
	N 34 12 08				
Tolovana, Alaska ⁸	O 149 30 00	KIZ	300	Telefunken, 1000	300, 600
	N 65 00 00				

¹ Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

² Service, O; hours, 6m. 10s.

³ Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

⁴ Radio station operated and controlled by Charles L. Austin. The station is limited to correspondence on ships' business with vessels entering and leaving the port of Portland.

⁵ Hours, X.

⁶ Radio station operated and controlled by the Northwestern Electric Co.

⁷ Radio station operated and controlled by the Southern California Edison Co. The station is limited to correspondence with stations of the Southern California Edison Co.

⁸ Radio station operated and controlled by the Alaska Wireless Telegraph Co.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Service.	Hours.
Atlanta ¹	KGR	Marconi.....	300, 600		
Cacique ²	WBE		300, 600		
Captain T. M. Morrison ³	WYZ	U. S. Army, 500.	1200	O	X
General Geo. H. Weeks ⁴	WZT	do.....	1200	O	X
General G. W. Getty ⁵	WYS	do.....	1200	O	X
General J. M. Brannan ⁶	WZV	do.....	1200	O	X
General Nathaniel Greene ⁷	WZR	do.....	1200	O	X
General Richard Arnold ⁸	WYY	do.....	1200	O	X
General R. N. Batchelder ⁹	WZW	do.....	1200	O	X
General Timothy Pickering ¹⁰	WZQ	do.....	1200	O	X
Henry Wilson ¹¹	WZS	do.....	1200	O	X
Major Albert G. Forse ¹²	WYQ	do.....	1200	O	X
Ossipee ¹³	NRJ	U. S. C. G., 1000.	{ 300, 600, 750, 1000 }	PG	N
Roosevelt ^{14,7}	NLR	Composite, 400..	300, 600	O	X
Sprigg Carroll ¹⁵	WZU	U. S. Army, 500.	1200	O	X
Tallapoosa ¹⁶	NRV	U. S. C. G., 1000.	{ 300, 600, 750, 1000 }	PG	N

¹ Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C. Army tug.

² Radio station operated and controlled by the Cuba Improvement & Steamship Co., owner of vessel.

³ W. R. Grace & Co., owner of vessel.

⁴ Range, 30.

⁵ Radio station operated and controlled by the United States Coast Guard, Treasury Department, Washington, D. C.

⁶ Range, 300; rates, 4 cents per word, 40 cents minimum per radiogram.

⁷ Radio station operated and controlled by the United States Department of Commerce, Bureau of Fisheries, Washington, D. C.

⁸ Range, 300.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; c—land station.]

Call signal.	Station.	Call signal.	Station.
KDP	Portland, Oreg.....c	WYQ	Major Albert G. Forse.....b
KGN	Portland, Oreg.....c	WYS	General G. W. Getty.....b
KGR	Atlanta.....b	WYY	General Richard Arnold.....b
KIZ	Tolovana, Alaska.....c	WYZ	Captain T. M. Morrison.....b
KJA	Jualin, Alaska.....c	WZQ	General Timothy Pickering.....b
KJR	Rialto, Cal.....c	WZR	General Nathanael Greene.....b
NLR	Roosevelt.....b	WZS	Henry Wilson.....b
NRJ	Ossipee.....b	WZT	General Geo. H. Weeks.....b
NRV	Tallapoosa.....b	WZU	Sprigg Carroll.....b
WBE	Cacique.....b	WZW	General J. M. Brannan.....b
WUU	Fort Adams, R. I.....c		General R. N. Batchelder.....b

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Athens, Ohio.....	8YP	300, 425.....	P	X	Ohio University.
Bremerton, Wash.....	7XL	300, 600, variable.....	P	X	T. M. Libby.
Rapid City, S. Dak.....	9XA	Variable.....	P	X	Claude C. Van Nuyss (South Dakota School of Mines).

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
7XL	Seventh district: Bremerton, Wash.	9XA	Ninth district: Rapid City, S. Dak.
8YP	Eighth district: Athens, Ohio.		

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

DENVER, COLO.—Hours, 9m–11.30m, 7.30e–11s.

GALVESTON, TEX.—W. L., 300, 500, 600; hours, 7m–12m, 1s–2m.

IDITAROD, ALASKA.—G. loc., (approximate) 0 158° 00' 00'', N 62° 40' 00''; hours, 9m–7s.

NEWTON, MASS.—System, Clapp-Eastham, 2500. Notes, Radio station operated and controlled by Ralph C. Emery. The station is limited to private correspondence with vessels for which John S. Emery & Co. (Inc.), are agents.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ALABAMA (WFB).—Hours, X.

ALBERTA.—Range, 200; system, Marconi, 1000; W. L., 300, 600; 1800; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Fred Gilbert Bourne, owner of vessel (yacht).

- ATLANTIC.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. New York Inter-ocean & Coastwise Steamship Co., owner of vessel.
- ATLANTIC CITY.**—Strike out all particulars.
- CAROLINA (WFE).**—Hours, X.
- CITY OF ALPENA II.**—Strike out system. Note, Detroit & Cleveland Navigation Co., owner of vessel.
- CITY OF BENTON HARBOR.**—Hours, X.
- CITY OF DETROIT II.**—Strike out system. Note, Detroit & Cleveland Navigation Co., owner of vessel.
- CITY OF MACKINAC II.**—Strike out system. Note, Detroit & Cleveland Navigation Co., owner of vessel.
- CITY OF St. IGNACE.**—Strike out system. Note, Detroit & Cleveland Navigation Co., owner of vessel.
- CITY OF St. JOSEPH.**—System, Marconi, 240; hours, X.
- CITY OF SYDNEY.**—Strike out system. Note, Pacific Mail Steamship Co., owner of vessel.
- COMMONWEALTH (KXC).**—System, Fessenden, 260; W. L., 300, 550, 600.
- EDGAR H. VANCE.**—Strike out system. Note, Hammond Lumber Co., owner of vessel.
- EVANGELINE.**—System, Marconi, 1000. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Evangeline Co. (Plant Line Steamship Co.), owner of vessel.
- FINLAND.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. International Mercantile Marine Co. (Panama Pacific Line), owner of vessel.
- FORWARD (KPF).**—Rates, 4c. per word, 40c. minimum per radiogram.
- GULF COAST.**—Range 200; system, Marconi, 240; service, PG; hours, X; rate, 4c. per word, 40c. minimum per radiogram.
- HOWARD.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4c. per word, 40c. minimum per radiogram; transoceanic service, 8c. per word, 80c. minimum per radiogram.
- HOWICK HALL.**—Hours, X.
- IAQUA.**—Strike out system. Note, John A. McGregor, owner of vessel.
- INDIANA (WFC).**—Hours, X.
- J. B. STETSON.**—Strike out system. Note, Hicks-Hauptman Navigation Co., owner of vessel.
- KROONLAND.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. International Mercantile Marine Co. (Panama-Pacific Line), owner of vessel.
- LEELANAW.**—Strike out all particulars.
- LUNDIN.**—Strike out all particulars.
- LYSISTRATA.**—System, Marconi; W. L., 300, 600; service, PG. Note, Radio station operated and controlled by James Gordon Bennett, owner of vessel (yacht).
- OCEANA.**—Strike out system. Note, Bermuda-American Steamship Corporation, owner of vessel.
- OREGON (WOU).**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Crowley Launch & Tugboat Co., owner of vessel.
- PACIFIC.**—Range, 250; system, Wireless Specialty Apparatus Co., 1000; service, PG; hours, X; rate, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Emery Steamship Co., owner of vessel.
- PILGRIM.**—Strike out all particulars.
- P. R. R. BARGE 707.**—Strike out all particulars.
- PURITAN (KXX).**—Strike out all particulars.
- PURITAN (WDU).**—Hours, X.
- RAMOS.**—Rates, 4 c. per word, 40 c. minimum per radiogram. Note, Sloan, Danenhower & Co., owner of vessel.
- RIVERSIDE.**—Strike out all particulars.
- SAN MARCOS.**—System, Marconi, 400; hours, X.
- SANTA RITA (WTG).**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SANTA ROSA.**—Strike out all particulars.
- S. M. FISCHER.**—Range, 200; system, Marconi, 450; W. L., 300, 600; service, PG; hours, X; rate, 2 c. per word, 20 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Reid Wrecking Co., owner of vessel.

SONOMA (WHM).—System, Poulsen arc. Note, Oceanic Steamship Co., owner of vessel.
 WESTERN STATES.—Strike out system. Note, Detroit & Cleveland Navigation Co., owner of vessel.
 WINCHESTER.—Strike out all particulars.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals KMN, KPR, K VX, KXG, KXK, KZK, WGN, WNI, and WRM.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1914, only.]

AMESBURY, MASS.—Strike out all particulars.
 ANN ARBOR, MICH.—W. L., 450, 600, 1800.
 DETROIT, MICH.—Strike out all particulars.
 GLOUCESTER, MASS.—W. L., 300, 600, variable; service, P; hours, X.
 NEW YORK, N. Y. (2XH).—W. L., 300, 540, 600, 800.

MISCELLANEOUS.

COMMERCIAL TRAFFIC REGULATIONS OF NAVAL RADIO SERVICE.

The superintendent of the United States Naval Radio Service, Radio, Va., announces the completion of the Commercial Traffic Regulations of that service. These books may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 25 cents per copy.

LONDON RADIOTELEGRAPH CONVENTION.

The Department has been advised by the State Department that since January 1, 1915, New Caledonia and Tonga have acceded to the International Radiotelegraph Convention, signed at London on July 5, 1912.

RADIO SERVICE PERSONNEL.

Charles Blankenship, of Everett, Mass., formerly radio electrician on the coast-guard cutter *Gresham*, has been appointed as an assistant radio inspector in the service of the Bureau of Navigation at Chicago, Ill.

AWARD OF MEDALS TO BUREAU OF NAVIGATION AND PERSONNEL.

The superior jury of the Panama-Pacific International Exposition has awarded the following medals to the Bureau of Navigation: Radio apparatus, medal of honor; educational demonstration of methods and apparatus for enforcement of the Federal radio law, silver medal.

Silver medals for collaboration with the Department of Commerce in its exhibit at the exposition have been awarded by the superior jury to V. Ford Greaves, radio engineer, and Benjamin E. Wolf, radio inspector.

COMMERCIAL OPERATOR REPRIMANDED.

The attention of all operators is again invited to the Laws and Regulations of the Department, page 74, paragraph 210, regarding the use of profane or obscene language in radio communication.

The superintendent of the Naval Radio Service recently reported a commercial operator in the sixth district for a violation of this regulation, and the radio inspector at San Francisco recommended that his license privilege be suspended. The operator has been severely reprimanded by the Secretary of Commerce for his misconduct, no further action being taken on account of the recommendation of the operator's employer, attesting to his previous good record.

Any future violations of this regulation may be subject to more drastic action on the part of the Department.

ADDITIONAL COPIES

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SEP 21 1915

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, September, 1915—No. 9

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the list of Radio Stations of the United States.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of The Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in The Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.**INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.****Nature of service:**

PG=General public.

PR=Limited public.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in cents. (The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refers to notes in the Berne list.

Co. =Company.

NOTICE.

It will be noted that the additions, alterations, and corrections contained in this Bulletin apply to the List of Radio Stations of the United States, edition of July 1, 1914.

The additions, alterations, and corrections which will appear in the October issue of this bulletin will be supplementary to the List of Radio Stations of the United States, edition of July 1, 1915, which is now in the hands of the printer, although it is not possible at this time to anticipate its delivery. All editions, alterations, and corrections appearing in the October and later editions of this Bulletin should be saved and inserted in the new annual list as soon as it is received.

A sufficient number of blank pages will be inserted in the back of the new list in order that the additions appearing in the Bulletins may be clipped and pasted therein, enabling operators and others concerned to keep their annual list up to date with very little trouble.

NEW STATIONS.**SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.**

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	Wave lengths.	Owner of vessel.
Chalmette.....	KKC	300, 600...	Southern Pacific Co.
Mukilteo.....	WRL	300, 600...	Charles Nelson Co.
Remlik.....	KZR	300, 600...	Willis S. Kilmer.
Roamer.....	KZN	.....	State of Florida.

¹ Range, 200; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4c. per word, 40c. minimum per radiogram; transoceanic service, 8c. per word, 80c. minimum per radiogram. Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Call sig- nal.	Station.	Call sig- nal.	Station.
KKC KZN	Chalmette. Roamer.	KZR WRL	Remlik. Mukilteo.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, only.]

Station.	Call sig- nal.	Wave lengths.	Service.	Hours.	Station controlled by—
Cincinnati, Ohio.....	8ZH	200, 300.....	P	X	Clayton M. Howes (Hughes High School).
Lima, Ohio.....	8YL	200, 425.....	P	X	J. E. Collins (Board of Edu- cation).
Mobile, Ala.....	5ZM	200, 300, 450.	P	X	Ben W. Martin.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

CHICAGO, ILL.—W. L., 300, 500, 600; service, PG and PR. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The station is open only during the season of navigation.

DETROIT, MICH. (WDR).—Name, River Rouge, Mich.; system, Marconi, 480; W. L., 300, 500, 600; service, PG and PR.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ADDISON E. BULLARD.—Strike out all particulars.

ADMIRAL SCHLEY.—Rates, 4c. per word; 40c. minimum per radiogram.

ADMIRAL WATSON.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Pacific-Alaska Navigation Co., owner of vessel.

ALLIANCE.—Range, 100; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. North Pacific S. S. Co., owner of vessel.

AMERICA.—Strike out all particulars.

ANTILLA.—Hours, N.

ASTRAL.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.

BRILLIANT.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.

CALIFORNIA (KYQ).—Strike out system. Note, Mrs. Clara B. Stocker, owner of vessel (yacht).

CARLOS.—Strike out system. Note, Olson & Mahony Steamship Co., owner of vessel.

CAROLYN.—Strike out all particulars.

COMET (KTJ).—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.

DOROTHY BRADFORD.—Range, 100; system, Wireless Specialty Apparatus Co., 1,000; strike out rates. Notes, Radio station operated and controlled by the Cape Cod Steamship Co., trustees, owner of vessel. Apparatus for emergency use only; not open to public service.

- EDGAR H. VANCE.—Strike out all particulars.
 FORWARD (KPF).—Strike out all particulars.
 GLENPOOL.—Range, 200; system, Telefunken, 1,000; service, PG; hours, 9m–12m, 2s–5s, 8s–10.30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
 I. J. MERRITT.—Strike out all particulars.
 KINGFISHER.—Strike out all particulars.
 LAKEPORT.—Strike out all particulars.
 LAKEWOOD.—Strike out all particulars.
 MINNESOTA (WMI).—System, Marconi, 480; W. L., 300, 600; service, PG; rates, 8 c. per word, 80 c. minimum per radiogram.
 MONTAUK.—Strike out all particulars.
 MOTANO.—Range, 200; system, Telefunken, 1,000; service, PG; hours, 9m–12m, 2s–5s, 8s–10.30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
 OSSABAW.—Strike out all particulars.
 PERFECTION.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.
 RADIANT.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.
 RAYO.—Notes, Radio station operated and controlled by the Atlantic Communication Co. Standard Transportation Co., owner of vessel.
 SATILLA.—Strike out all particulars.
 SECURITY.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.
 SHINNECOCK.—Strike out all particulars.
 S. O. Co. No. 92.—Name, S. T. Co. No. 92. Note, Standard Transportation Co., owner of vessel.
 S. O. Co. No. 94.—Name, S. T. Co. No. 94. Note, Standard Transportation Co., owner of vessel.
 STANDARD.—Note, Standard Transportation Co., owner of vessel.
 THEODORE ROOSEVELT.—Strike out all particulars.
 ULYSSES.—System, Marconi; W. L., 300, 600. Note, Panama Canal, owner of vessel.
 VESTA (KTS).—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.
 WAHAMA.—Strike out all particulars.
 WM. E. CHAPMAN.—Strike out all particulars.
 WYANDOTTE.—Strike out all particulars.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KTP, read: S. T. Co. No. 94. KTY, read: S. T. Co. No. 92. Strike out particulars after the following call signals: KEN, KEO, KNF, KNS, KNT, KNW, KNZ, KPF, KRM, KRQ, KWL, KZW, WCT, WDJ, WDK, WPK, WQE.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, October, 1915—No. 10

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

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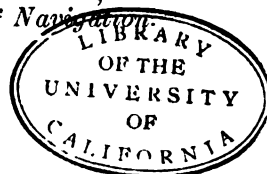
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Items of general interest concerning the enforcement of the radio laws are printed in The Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

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NEW STATIONS.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSEL.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Service.	Hours.
Alicia ¹	KZB	De Forest, 800.....	300, 600	PG	X
Azalea ²	NLO				
Ellington ³	NLN				
Fort Bragg ⁴	WLH		300, 600		
Mount Hope ⁵	KOL	Composite, 200.....	300, 600	P	X
Silver Shell ⁶	WIA	Marconi.....	300, 600		

¹ Range, 45; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by Alfred L. du Pont, owner of vessel (yacht).

² U. S. Department of Labor (Immigration Service), owner of vessel.

³ Higgins Lumber Co., owner of vessel.

⁴ Radio station operated and controlled by the Providence, Fall River & Newport Steamboat Co., owner of vessel.

⁵ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Silver Shell Steamship Co., owner of vessel.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[ADDITIONS TO THE LIST OF RADIO STATIONS OF THE UNITED STATES, EDITION OF JULY 1, 1915, ONLY.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Auburn, Ala.	5YA	1625, 1800	P	X	Alabama Polytechnic Institute.
Davenport, Iowa.....	9XE	300	P	X	William H. Kirwan.
Denver, Colo.	9ZD	200, 425	P	X	Edward C. Stockman.
Louisville, Ill.	9ZL	200, 425	P	(1)	Cecil Bridges.
New Orleans, La.	5XM	300, 600	P	X	Marconi Co.
New York, N. Y.	2YM	233, 300, 600	P	X	Y. M. C. A. Telegraph School.
Ridgway, Pa.	8XO	300, 425	P	X	W. P. Osterhout (Pittsburgh Wireless Equipment Co.).
Rockford, Ill.	9YB	200	P	X	Rockford School of Engineering.
Tiffin, Ohio.	8ZT	200, 425	P	(2)	John J. Grassman.
Washington, D. C.	3YM	200, 300, 400	P	X	McKinley Manual Training School.
Do.	3YN	300, 400, 1800	P	X	James E. Smith (National Radio School).

¹ 11.55 a. m. to 1 p. m.; 6.30 p. m. to 11 p. m.

² 7 p. m. to 10.30 p. m.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Call signal.	Station.	Call signal.	Station.
KOL	Mount Hope.	NLO	Azalea.
KZB	Alicia.	WIA	Silver Shell.
NLN	Ellington.	WLH	Fort Bragg.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
2YM	Second district: New York, N. Y.	8XO	Eighth district: Ridgway, Pa.
3YM	Third district: Washington, D. C.	8ZT	Tiffin, Ohio.
3YN	Do.		Ninth district:
5XM	Fifth district: New Orleans, La.	9XE	Davenport, Iowa.
5YA	Auburn, Ala.	9YB	Rockford, Ill.
		9ZD	Denver, Colo.
		9ZL	Louisville, Ill.

ABBREVIATIONS.**INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.****Nature of service:**

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Hours of operation:

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X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

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OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in cents. (The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

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ASHTABULA, OHIO.—System, Marconi. 480; W. L., 300, 500, 600; hours, 7.30m–11.30m, 12.30s–5s.

BALTIMORE, MD.—System, Marconi-United. 400.

BUFFALO, N. Y.—System, Marconi. 480; W. L., 300, 500, 600; hours, Sept. 16 to Dec. 15 and Apr. 15 to June 2, 7s–12s. 1m–7m; June 3 to Sept. 15, 7m–12m, 1s–6s, 7s–12s, 1m–6m.

- CALUMET, MICH.**—System, Marconi, 480; W. L., 300, 500, 600. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- CLEVELAND, OHIO.**—System, Marconi, 480; W. L., 300, 500, 600.
- DULUTH, MINN.**—System, Marconi, 480; W. L., 300, 500, 600. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- FORT WORDEN, WASH.**—Service, PG.
- FRANKFORT, MICH.**—System, Marconi, 480; W. L., 300, 500, 600.
- GRAND HAVEN, MICH.**—System, Marconi, 480; W. L., 300, 500, 600.
- LUDINGTON, MICH.**—System, Marconi, 480; W. L., 300, 500, 600.
- MACKINAC ISLAND, MICH.**—G. loc., O 84° 37' 00'', N 45° 50' 00''; system, Marconi, 480; W. L., 300, 500, 600; hours, Sept. 16 to Oct. 1 and June 7 to June 30, sunset to sunrise; July 1 to Sept. 15, 1m–6m, 7m–12m, 1s–6s, 7s–12s.
- MANISTIQUE, MICH.**—System, Marconi, 480; W. L., 300, 500, 600.
- MANITOWOC, WIS.**—System, Marconi, 480; W. L., 300, 500, 600. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- MARSHFIELD, ORIG.**—System, Marconi, 300; hours, first 15 minutes of each hour from 8m–6s.
- MILWAUKEE, WIS.**—G. loc., O 87° 55' 25''–N 43° 02' 50''; system, Marconi, 480; W. L., 300, 500, 600.
- NEW ORLEANS, LA. (WIJK).**—Hours, 7.05m–8m, 10m–10.25m, 10.45m–10.55m, 1s–1.20s, 3s–4s, 5s–5.30s, 6s–6.30s, 8s–8.55s, 10s–11s.
- NOME, ALASKA.**—Hours, N.
- SAGAPONACK, N. Y.**—Hours, X.
- SEATTLE, WASH.**—Service, PG and PR; hours, 8m–12m, 1s–5s, except Sundays and holidays; rates, PG service, 3 c. per word 30 c. minimum per radiogram. Notes, Radio station operated and controlled by the city of Seattle (harbor department). The station corresponds with the harbor patrol boat and all vessels entering Puget Sound. No charge for messages relating to shipping.
- TOLOVANA, ALASKA.**—Name, Brooks, Alaska.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- ADMIRAL DEWEY.**—Rates, 4 c. per word 40 c. minimum per radiogram.
- ADMIRAL FARRAGUT.**—Rate, 4 c. per word 40 c. minimum per radiogram.
- ARIZONA.**—System, Marconi, 240.
- BERKSHIRE.**—Strike out all particulars.
- BRUNSWICK.**—Range, 150.
- CAROLINA.**—Range, 100; system, Marconi, 240.
- CASSANDRA.**—Name, Casiana. Note, Edward L. Doheny, owner of vessel (yacht).
- CELILLO.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Celilo Steamship Co., owner of vessel.
- CHALMETTE.**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Southern Pacific Co., owner of vessel.
- CITY OF DETROIT III.**—System, Marconi, 240.
- CITY OF MONTGOMERY.**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CITY OF SAVANNAH.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CITY OF SEATTLE.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Pacific Coast Steamship Co., owner of vessel.

- COAMO.**—System, Marconi, 1000; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- COLUMBIA (KRO).**—Strike out all particulars.
- COLUMBIA (WHC).**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Henry Wilson, owner of vessel.
- COMUS (KKD).**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CORDOVA.**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, N; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- CRETAN.**—Range, 150; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- DESPATCH.**—Hours, N.
- DORA.**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- EDITH.**—Strike out all particulars.
- EDWARD L. DOHENY.**—System, Marconi, 1000; W. L., 300, 475, 600; rates, North and South American service 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- ESPERANZA.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- GEORGIA (WFA).**—System, Marconi, 240.
- GRECIAN.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- GUARDIAN.**—Hours, X.
- HAVANA.**—Range, 300; system, Marconi, 1000; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service 8 c. per word 80 c. minimum per radiogram.
- HONOLULU.**—Hours, X.
- INDIAN (KQI).**—Strike out all particulars.
- INDIANA (WFC).**—Range, 100; system, Marconi, 240.
- JAMESTOWN.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- JOHN A. HOOPER.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. John A. Hooper Co., owner of vessel.
- KERSHAW.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- LEXINGTON (KQL).**—Strike out all particulars.
- LYDONIA.**—System, Marconi, 240.
- MAROWIJNE.**—Strike out all particulars.
- MASCOTTE.**—System, Marconi, 200; W. L., 300, 600. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Peninsular & Occidental Steamship Co., owner of vessel.
- MEXICO.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MIAMI (KOZ).**—System, Marconi, 240; W. L., 300, 600. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Peninsular & Occidental Steamship Co., owner of vessel.
- MISSOURI (WFX).**—System, Marconi, 240. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Northern Michigan Transportation Co., owner of vessel.
- NORTH STAR (KYZ).**—Strike out all particulars.
- OLEUM.**—Note, Union Oil Co., owner of vessel.
- PARTHIAN.**—Strike out all particulars.
- PURITAN.**—Range, 100; system, Marconi, 240.
- QUANTICO.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

- RELIEF.**—Range, 75; system, De Forest, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Merritt & Chapman Derrick & Wrecking Co., owner of vessel.
- ROAMER.**—Range, 100; system, Marconi, 1000; W. L., 300, 450, 600; service, PG; hours, X; rate, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by the State of Florida (shellfish commission), owner of vessel.
- SAN JACINTO.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- SANTA MARIA (WTF).**—Note, Santa Maria Steamship Co., owner of vessel.
- SANTA RITA (WTG).**—Range, 100; system, Marconi, 400; service, PG; hours, X.
- SARATOGA (KWS).**—Range, 300; system, Marconi, 1000; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- SAYONARA.**—Range, 200; system, Marconi, 600; W. L., 300, 600.
- SEEBEE.**—System, Marconi, 240; hours, X.
- SOUTH AMERICAN.**—Strike out system. Note, The Texas Co., owner of vessel.
- STANDARD.**—Note, Standard Oil Co. of New Jersey, owner of vessel.
- TIONESTA.**—System, Marconi, 240.
- TUSCAN.**—Strike out all particulars.
- UMATILLA.**—System, Marconi, 480. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Pacific Coast Steamship Co., owner of vessel.
- VIGILANCIA.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Walker, Armstrong & Co., owner of vessel.
- WHITTIER.**—Note, Union Transportation Co., owner of vessel.
- YUCATAN.**—Range, 100; system, Marconi, 480.
- ZULIA.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KIZ, *read* Brooks, Alaska c; KYE, *read* Casiana b; strike out particulars following the call signals KDR, KQB, KQI, KQL, KQP, KQT, KRO, and WAE.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

BOSTON, MASS. (1XH).—Strike out all particulars.

WATCHAUG POND, R. I.—W. L., 200, 300, 425, 600; service, P; hours, X.

MISCELLANEOUS.

SIGNAL CORPS RADIO STATION CHANGES.

The Signal Corps station at Nome, Alaska, now maintains continuous service and the station at Fort Worden, Wash., is now open to general public service. The Signal Corps station at Fort St. Michael, Alaska, has been discontinued as an examination point where operators may secure licenses.

COMMERCIAL EXTRA FIRST-GRADE OPERATORS.

The names of the following operators have been added to the list of those to whom commercial extra first-grade licenses have been

issued by the Secretary of Commerce as a reward for long and efficient service: John W. Lee, Philadelphia, Pa., and Robert Boyd Black, San Francisco, Cal.

THE PROVED VALUE OF RADIO TO VESSELS IN DISTRESS.

During the fiscal year 1915 the radio inspectors of the Bureau reported 26 cases of vessels leaving our ports which met with accident or disaster, requiring the use of wireless to summon assistance. Four of these were from fire; 12 were from running ashore, stranding, or getting into an ice jam; 3 were from the breakage of machinery; 4 resulted from collisions; 1 from shifting of cargo; 1 vessel was storm-battered and water-logged; and 1 was torpedoed. Excepting in the case of the *Lusitania*, which was torpedoed, the assistance thus rendered resulted in but two lives being lost. Since the close of the fiscal year the following disasters have occurred:

On September 13, 1915, the Fabre Line steamship *Sant' Anna*, bound from New York to Naples with 1,700 Italian reservists and crew aboard, caught fire in mid-ocean and all persons on board were saved. The SOS call brought the steamship *Ancona* to the assistance of the disabled vessel and 600 persons were taken off. The *Sant' Anna* then proceeded to port, convoyed by the *Ancona*, and the entire 1,700 passengers and crew saved.

Six days after the *Sant' Anna* disaster, the Greek liner *Athinai*, bound from New York to Piraeus, caught fire in mid-ocean and was abandoned by the passengers and crew, numbering 470. The call for assistance was answered by the steamships *Tuscania* and *Roumanian Prince*; 341 persons were taken on board the *Tuscania*, the remaining 129 being taken off by the *Roumanian Prince*. The vessel was entirely destroyed.

The use of radio apparatus on vessels carrying passengers, or with 50 or more crew, is now accepted as essential to the safety of those on board, and the report of the *Athinai* shows conclusively that many persons might have been lost and perhaps the cause of the disaster never known had not this vessel been equipped with radio apparatus.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, November, 1915—No. 11

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

9936—15



NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Great Lakes, Ill., ^{1, 2}	O 87° 50' 00" N 42° 18' 30"	NAJ	800	U. S. Navy..	300, 600, 1000
Heald Bank Lightship * ^{3, 4}	O 94° 13' 00" N 29° 06' 00"	NLP	60	do.....	300, 600
Indianhead, Md., ⁵	O 77° 10' 55" N 38° 38' 00"	NBG	.....	.....do.....	300, 600, 750
Steamship Premier ^{6, 7}	O 158° 28' 00" N 58° 45' 00"	KMP	20	.....	300, 450, 600

* Radio station operated and controlled by the United States Naval Radio Service, Radio, Va.

¹ Great Lakes training station.

² Service, O; hours, N.

³ Off Galveston, Tex.

⁴ Service, O; hours, 8m 10s.

⁵ Service, O; hours, every hour on half hour from 8.30m. to 4.30s.

⁶ Moored schooner.

⁷ Hours, X; radio station operated and controlled by the Alaska Packers' Association. The station is limited to correspondence with Nushagak and Clark's Point, Alaska.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Service.	Hours.
General John M. Schofield ¹	WXW	U. S. Army.....	600	O	
Gold Shell ²	WIB	Marconi.....	300, 600	.....	
Pioneer (WPM) ³	WPM	Kilbourne & Clark, 120.....	300, 600	PG	X
Tyee ⁴	WPC	Kilbourne & Clark, 120.....	300, 600	PG	X

¹ Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

² Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Gold Shell Steamship Co., owner of vessel.

³ Range, 100; rates, 4 c. per word, 40 c. minimum per radiogram. Radio station operated and controlled by the Puget Sound Tugboat Co., owner of vessel.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Battle Creek, Mich.....	8ZC	800, 425	P	X	Bert E. Clough.
Schenectady, N. Y. (2YU).....	2YU	300, 2000	P	X	Walter L. Upson (Union College).

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KMP	Premier.....c	WIB	Gold Shell.....b
NAJ	Great Lakes, Ill.....c	WPC	Tyee.....b
NBG	Indianhead, Md.....c	WPM	Pioneer.....b
NLP	Heald Bank Lightship.....c	WXW	General John M. Schofield.....b

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name** =Name of station.
G. loc. =Geographical location: O=west longitude, N=north latitude.
Call =Call letters assigned.
System =Radio system used and sparks per second.
Range =Normal range in nautical miles.
W. L. =Wave lengths assigned: Normal wave length in italics.
Service =Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P=Private.
 O=Government business exclusively.
Hours =Hours of operation:
 N=Continuous service.
 X=No regular hours.
 m=a. m. (12m=midday).
 s=p. m. (12s=midnight).
Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent).
Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.**SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.**

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the List of Radiotelegraph Stations, published by the Berne bureau.]

- ADMIRAL EVANS.**—Range, 100; system, Kilbourne & Clark, 120; hours, N; strike out rates. Note, Radio station operated and controlled by the Pacific-Alaska Navigation Co., owner of vessel.
ANTILLES.—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
BATON ROUGE.—System, Marconi, 1000.
BRINDILLA.—System, Marconi. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
CADDO.—System, Marconi, 1000. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
CAMAGUEY.—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
CAROLINA (KGB).—Range, 300; system, Marconi, 1000; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
CITY OF BUFFALO.—Hours, X.
CITY OF MACON.—Range, 300; system, Marconi, 1000.
CITY OF ST. LOUIS.—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
COMMUNIPAW.—System, Marconi.
COPPENAME.—Range, 500.
CROFTON HALL.—System, Marconi, 1000; W. L., 300, 450, 600; hours, N.
CUSHING (KSC).—System, Marconi. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

- CYPRUS.**—Service, P; strike out rates. Note, Radio station operated and controlled by Daniel C. Jackling, owner of vessel (yacht).
- DAYTON.**—System, Marconi. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- DIAMOND HEAD.**—Strike out all particulars.
- ESSEX (KQE).**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EXCELSIOR (KKO).**—Range, 300; system, Marconi, 1000; W. L., 300, 465, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- FAVORITE.**—System, Marconi, 240.
- GLENPOOL.**—System, Marconi, 1000. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- HERBERT G. WYLIE.**—Range, 200; system, Marconi, 1000; service, PG; hours, X.
- HEREDIA.**—System, National Electric Signaling Co., 1000.
- JUNIATA (KQJ).**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- KOREA.**—Notes, Radio station operated and controlled by the Marconi Co. Atlantic Transport Co., owner of vessel.
- LAMPASAS.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- LOUISIANA (KUL).**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MARACAIBO.**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MERRIMACK.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MOMUS.**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MORENI.**—System, Marconi, 1000.
- MORRO CASTLE.**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- NAVAJO (WNJ).**—Range, 150; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- NORWOOD.**—Strike out all particulars.
- OLIVETTE.**—W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- ONTARIO (KQO).**—Range, 150; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PERSIAN.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PHILADELPHIA (KDA).**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PIONEER.**—System, Marconi, 1000; hours, X. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- POLARINE.**—System, Marconi, 1000. Note, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- SABINE.**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- SAN JUAN (KGJ).**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- STATE OF OHIO.**—System, Marconi, 120.

SUWANNEE.—Range, 150; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

S. V. LUCKENBACH.—Name, Onega. Note, Radio station operated and controlled by the Marconi Co. Barber & Co., owner of vessel.

TILlicum.—Strike out all particulars.

WILLIAM O'BRIEN.—Range, 200; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KGU, read, Onega, b. Strike out particulars following the call signals WNL, WSG, and WPT.

MISCELLANEOUS.

LIST OF RADIO STATIONS OF THE UNITED STATES.

The Bureau announces the completion of the 1915 edition of the List of Radio Stations of the United States, containing a list of 5,073 stations. The table given below shows the number of land, ship, special land, and amateur stations contained in this list as compared with the 1914 list:

Station.	1914	1915	Increase.
Government and commercial land stations.....	189	224	35
Government and commercial ship stations.....	895	895	.....
Special land stations.....	54	118	64
General and restricted amateur stations.....	2,796	3,836	1,040
Total.....	3,934	5,073	1,139

The appendix to this list contains several articles of interest to radio operators. These books may be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents per copy.

Copies of the Radio Communication Laws and Regulations of the United States may also be procured from the Superintendent of Documents at 15 cents per copy.

INTERNATIONAL LIST OF RADIOTELEGRAPH STATIONS.

The Director of the International Bureau of the Telegraph Union, Berne, Switzerland, has announced the completion of the fourth French edition of the Official Nomenclature of Radiotelegraph Stations of the World. The English and German editions of this list are now in the hands of the printer and will be available within a very short time.

CASUALTY REPORT.

The steamship *Mariposa*, of the Alaska Steamship Co., bound from Seattle, Wash., to southern Alaskan ports, grounded at 4.36 a. m., October 6, on the rocky shore off Pointer Island, Llama Passage, about 8 miles from the Indian village of Bella Bella, British Columbia.

SOS signals were transmitted at 4.40 a. m., and were answered by the steamship *Despatch*, of the Border Line Transportation Co., 30 miles distant, the steamship *Senator* of the Pacific Coast Co., 270 miles distant, and the Canadian land station at Triangle Island, British Columbia, approximately 150 miles distant.

The *Despatch* immediately hastened to the scene of the disaster, and after taking off all persons on board the *Mariposa*, remained near by until she could be of no further assistance.

The distress call was transmitted on the emergency radio equipment of the vessel, which was installed on the main deck and which remained above water for six hours, when the vessel slid into deeper water and the apparatus was submerged by the rising tide.

TAHITI RADIO STATION.

The radio station now being built by the French Government on Tahiti Island, Society Islands, will be ready to receive and transmit commercial messages before the close of 1915.

The temporary station, now in course of erection, will be followed by a much more powerful plant. The plans of the temporary station contemplate a 10-kilowatt installation of the type used by the French Government, with a wave length of 600 meters. The towers, two in number, will be 100 meters in height. The station will be expected to reach Awanui, New Zealand; Suva, Fiji; and the Samoan Islands.

Immediately upon the completion of the temporary station, work will begin on a permanent station of much greater power. This permanent 300-kilowatt station will be operated by a 500-horsepower gasoline engine, and will use a wave length of 2500 meters. There will be eight towers, each 100 meters high, erected in parallel rows of four towers. The space between the towers will be 250 meters, and 200 meters between parallels. There will be two antennæ, one of 600 meters wave length, the other of 2500 meters.

With the permanent station it is expected that communication will be established with stations in Cochin-China; South America; Honolulu, Hawaii; San Francisco, Cal.; Sydney; Australia; and even in Martinique and Guadeloupe, West Indies. All material used in the construction of these stations is supplied by the French Government and is shipped from France.

Call letters have not been assigned to the station and rates are not obtainable at the present time.

TEST OF AUXILIARY RADIO EQUIPMENT.

[Test of an Edison storage battery, type B-4-H, W. S., consisting of 100 cells rated at 50 ampere-hour capacity, used as an auxiliary source of power supply for a radio transmitter of the Marconi Wireless Telegraph Co. of America, known as the type P-5, one-half kilowatt (input to transformer primary), 500 cycle, quenched and rotary synchronous gaps. Height of antenna above load line, 95 feet; fundamental wave length, 293 meters.]

Because of the difference of opinion and the absence of any official information as to whether or not certain types of auxiliary apparatus and their source of auxiliary power supply fully comply with section 1 of the act of June 24, 1910, amended July 23, 1912, the Department believes it to be necessary that the various types of apparatus and auxiliary power be officially submitted to a test from time to time, which will furnish the information desired. In view of the above, the Department authorized that such a test be conducted in connec-

tion with the auxiliary equipment installed aboard the Merchants & Miners' Transportation Co.'s steamship *Howard*, plying between Baltimore, Norfolk, and Boston.

This test was conducted from July 13 to 19, 1915, en route from Norfolk to Boston and return from Boston to Baltimore by F. A. Kolster, of the Bureau of Standards, and R. Y. Cadmus, radio inspector, of the Bureau of Navigation, assisted by representatives of the Edison Storage Battery Co. and the Marconi Wireless Telegraph Co. of America.

The Edison battery installed on the steamship *Howard* consists of 100 cells type B-4-H, W. S., rated at 80 ampere hours. This battery supplies power to run a 110-volt motor, which drives the one-half kilowatt, 500-cycle generator of the radio transmitting equipment, and also supplies power for 25 or more deck lights, as illustrated in figure 1.

The voltage of the battery when fully charged is 140. It is necessary, therefore, to have a resistance in series with the battery in order to cut down the voltage at the terminals of the motor to 110. The

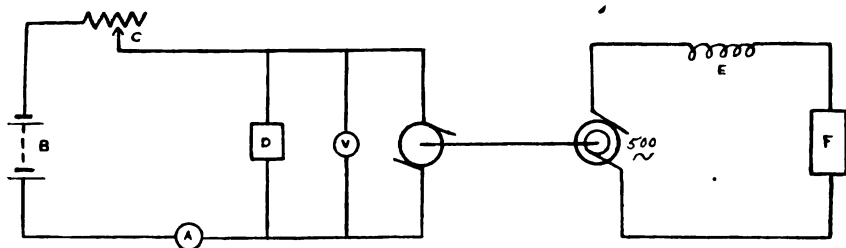


FIG. 1.

A, ammeter; B, 100-cell storage battery; C, variable resistance; D, deck lights; E, reactance; F, 500-watt load; V, voltmeter.

resistance supplied for this purpose is adjustable so that as the battery voltage gradually drops the voltage at the motor terminals can be kept at 110 by decreasing this resistance.

The first test of the battery was started at 6.20 p. m. on July 15, after the battery had been given an overcharge, as recommended by the representative of the Edison company who was present at the tests.

The test was conducted in the following manner: An artificial load of 500 watts was connected to the 500-cycle generator and a bank of about 25 lights was connected to the battery, these lights representing the deck lights proposed in case of emergency. An automatic sending key was connected in the generator circuit so that the load could be thrown on intermittently, as when sending at the rate of 15 to 20 words per minute. The curve shown in figure 2 indicates the behavior of the battery during the time of this test.

The arrangement of 100 cells gave an initial voltage of 140, a series resistance being used to reduce this voltage to 110, which is the voltage for which the motor is designed. This arrangement makes it possible to maintain the required voltage of 110 over a considerable length of time by adjusting the series resistance.

This arrangement is open to criticism, however, because of the fact that it is possible, through carelessness or otherwise, to throw the

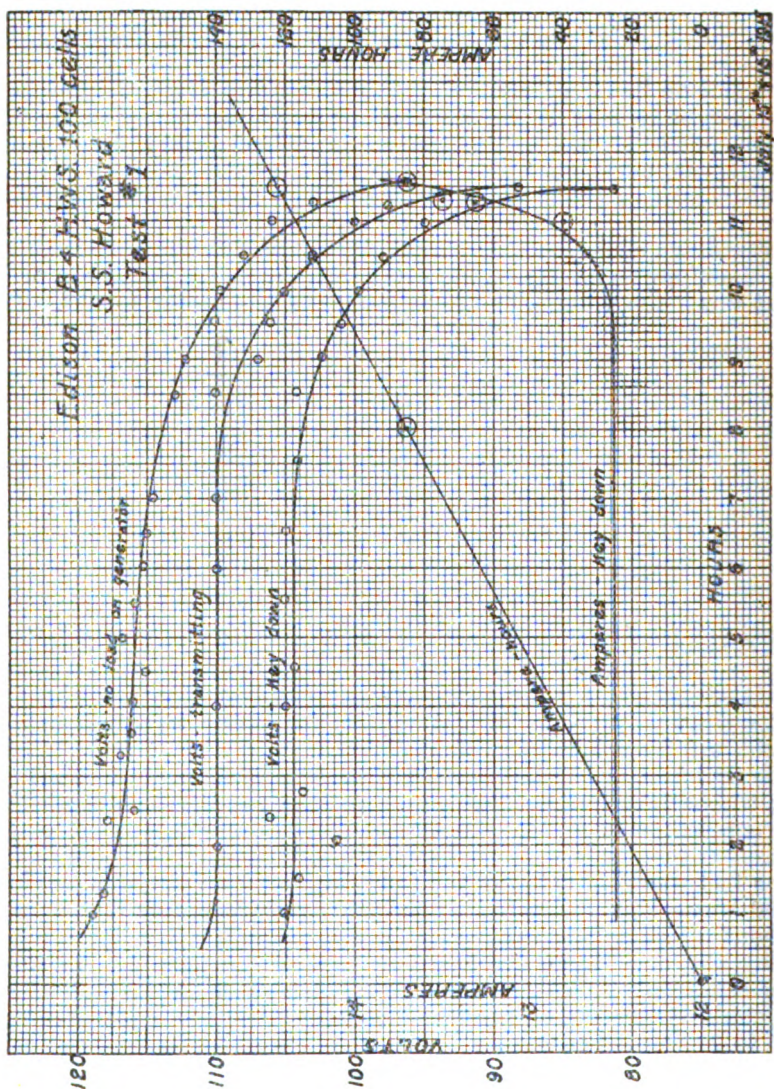


FIG. 2.

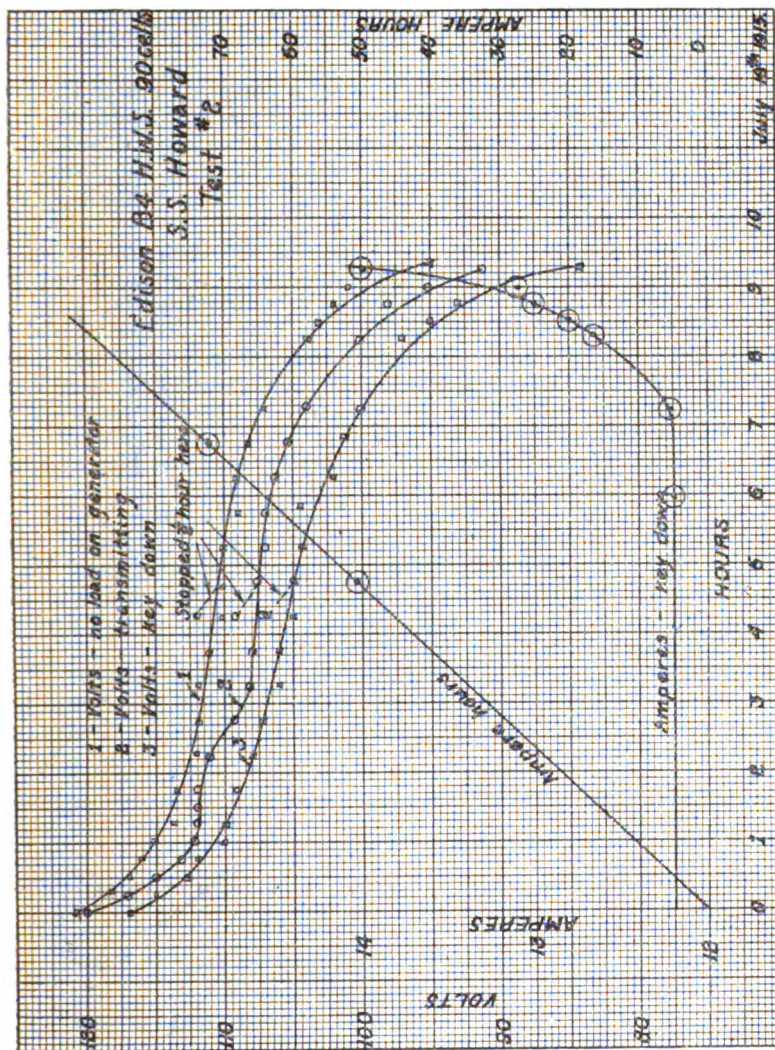


FIG. 3.

entire 140 volts across the motor terminals, in which case the motor would probably be burned out.

A second test of the battery was therefore made on July 18, using only 90 cells instead of 100 cells. The initial voltage of these 90 cells after charge was about 125. No resistance was used in series and the voltage across the motor terminals was not sufficiently in excess of 110 during the first part of the test to cause any motor trouble. The curve shown in figure 3 indicates the behavior of the battery during the time of this test.

It will be noted that the 90-cell battery apparently meets the four-hour and six-hour service requirements of the act of June 24, 1910, amended July 23, 1912, and the London International Convention, respectively, particularly when it is considered that the tests were made under continuous sending conditions, no time being taken for receiving.

Although at no time during the tests did the temperature of the electrolyte show an excessive rise, it has been recommended that proper ventilation be provided in battery compartments.

The motor generator set furnished with this equipment is of the inductor type. Small motor generator sets generally require careful attention, and since these machines must be depended upon in emergency cases frequent inspection is necessary. Therefore radio inspectors should make a careful examination of these motor generator sets at each inspection, particularly of the motor brushes, bearings, and oil chambers.

The radio transmitter furnished is of modern design, efficient, and easily operated. Provision has been made for the use of wave lengths of 300, 450, and 600 meters. The transmitter may be set for any of these wave lengths by means of a simple switch. The antenna current was found to be about 6 amperes for 450 and 600 meters and about 4 amperes for 300 meters.

Under these conditions it is believed that the requirement of 100 miles communication will be fulfilled, as indicated in the range tests given below, conducted while en route from Norfolk to Boston and return to Baltimore.

Date.	Time. ¹	Position of steamship Howard.	Receiving stations.	Distance in nautical miles.
1915.				
July 14...	4.55 a. m.	21 miles NE. of Winter Quarter Light.	Virginia Beach, Va.....	105
July 14...	5.00 a. m.	22 miles NE. of Winter Quarter Light.	S. S. Juniata, 3 miles NE. of Cape Charles.	110
July 14...	5.27 a. m.	28 miles NE. of Winter Quarter Light.	Cape Hatteras, N. C.....	211
July 14...	5.45 a. m.	33 miles NE. of Winter Quarter Light.	S. S. Juniata, abreast of Smith Island.	101
July 14...	6.22 a. m.	42 miles NE. of Winter Quarter Light.	S. S. Juniata, off Virginia Capes...	117
July 14...	4.00 p. m.	7 miles E. of Fire Island.....	S. S. Gloucester, lat. 39° 12' N., long. 73° 27' W.	87
July 15...	9.00 a. m.	5 miles NNE. of Sluce Lightship...	Nantucket Lightship.....	93
July 18...	5.15 a. m.	Off Cape Henry.....	S. S. Juniata, 18 miles NE. of Winter Quarter Light.	100
July 18...	5.45 a. m.	do.....	S. S. Juniata, 25 miles NE. of Winter Quarter Light.	107
July 18...	6.45 a. m.	Near Old Point Comfort.....	S. S. Juniata, 40 miles NE. of Winter Quarter Light.	127
July 18...	7.00 a. m.	do.....	S. S. Powhatan, off Sparrows Point	160

¹ Weather clear, static medium, during all tests.

The receiving apparatus is of modern type and much more efficient than the older types. It has been recommended that means be provided in these receivers for connecting the detector and telephones in the antenna or primary circuit for "listening in" purposes, and the inductance position with the series condenser short circuited should be plainly marked for 600 meters. This would enable the operator more quickly to hear calls without disturbing the secondary circuit of his receiver and the coupling position of his coils.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, December, 1915—No. 12

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

16354—15



NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Service.	Hours.
Fort Constitution, N. H. ¹	WZE	U. S. Army.....	825	O	X
Fort Dade, Fla. ¹	WZK	do.....	825	O	X
Fort Moultrie, S. C. ¹	WZF	do.....	825	O	X

¹ Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Service.	Hours.
Alaska ¹	WWS	Kilbourne & Clarke, 240...	300, 450, 500, 600	PG	X
Edna ²	WSP	.....	.....	.....	.....
Galatea ³	WGF	Marconi.....	300, 600	.....	.....
Mackinaw ⁴	WHW	Halcun, 240.....	300, 600	PG	X
Nevada ⁵	WFD	.....	300, 600	.....	.....
North America ⁶	KRU	Composite.....	300, 600	PG	X
Orleanian ⁷	KON	Marconi.....	300, 600	.....	.....
Pacific.....	WRD	.....	300, 600	.....	.....

¹ Range, 100; rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.

² Sudden & Christensen, owner of vessel.

³ Radio station operated and controlled by the Marconi Co. E. L. Ford, owner of vessel.

⁴ Range, 500; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by George and James Flood, owners of vessel.

⁵ Goodrich Transit Co., owner of vessel.

⁶ Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Radio station operated and controlled by the Merritt & Chapman Derrick and Wrecking Co., owner of vessel.

⁷ R. Lawrence Smith (Inc.), owner of vessel.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Name.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Lexington, Ky.....	9YL	500, 1800	P	X	Otto Holstein (Co. A, Signal Corps, Ky. N. G.).
Marion, Ohio.....	8ZD	200, 425	P	X	Kath Henney.
New Braunfels, Tex.....	5ZB	200, 450	P	X	Arthur E. Mollenhauer.
San Jose, Cal.....	6XF	300, 600, variable	P	X	Charles D. Herrold.
Wayne, Nebr.....	9YT	300, 425	P	X	U. S. Conn. president State Normal School.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KON	Orleanian.....b	WSP	Edna.....b
KRU	North America.....b	WWS	Alaska.....b
WFD	Nevada.....b	WZE	Fort Constitution, N. H.....c
WGF	Galatea.....b	WZF	Fort Moultrie, S. C.....c
WHW	Mackinaw.....b	WZK	Fort Dade, Fla.....c
WRD	Pacific.....b		

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
5ZB	Fifth district: New Braunfels, Tex.	8ZD	Eighth district: Marion, Ohio.
6XF	Sixth district: San Jose, Cal.	9YL	Ninth district: Lexington, Ky.
		9YT	Wayne, Nebr.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name =Name of station.
 G. loc. =Geographical location: O=west longitude, N=north latitude.
 Call =Call letters assigned.
 System =Radio system used and sparks per second.
 Range =Normal range in nautical miles.
 W. L. =Wave lengths assigned: Normal wave length in italics.
 Service =Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P=Private.
 O=Government business exclusively.
 Hours =Hours of operation:
 N=Continuous service.
 X=No regular hours.
 m=a. m. (12m=midday).
 s=p. m. (12s=midnight).
 Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
 Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

CHICAGO, ILL. (WGO).—Hours, 7m–6s, 8s–7m.

EAST SAN PEDRO, CAL.—Notes, Radio station operated and controlled by the Marconi Co. The station also communicates with Avalon, Cal. For radiotelegrams exchanged with the ships *Hermosa* and *Cabrillo*, 2 c. per word 20 c. minimum per radiogram (address and signature free of charge). For radiotelegrams exchanged with Avalon, Cal., 3 c. per word 30 c. minimum per radiogram.

GRAND HAVEN, MICH.—Hours, 7m–11m, 8s–11s.

JACKSONVILLE, FLA.—Range, 200; system, Marconi, 240.

LUDINGTON, MICH.—Hours, 7m–11m, 12m–6s, 8s–1m, 2m–7m, when lake is open to navigation.

MANITOWOC, WIS.—Hours, 8m–11.30m, 2.30s–6s, 7.30s–8.30s, time of the meridian 90° west of Greenwich.

MILWAUKEE, WIS.—Hours, 8m–12m, 1s–5m.

SAVANNAH, GA.—W. L., 300, 550, 600.

SEA GATE, N. Y.—Range, 200; system, Marconi, 1000.

SEATTLE, WASH. (KPA).—Range, 250; system, Marconi, 1000; W. L., 300, 540, 600, 1700, 3100; service, PG and limited commercial. Note, Radio station operated and controlled by the Marconi Co.

UNDERWOOD, WASH.—G. loc. (approximate), 0 45° 45' 00'', N. 121° 32' 00''; range, 75; system, composite, 400; W. L., 300, 600, 1700; hours, X.

VIRGINIA BEACH, VA.—Range, 200; system, Marconi, 480.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ADMIRAL EVANS.—Range, 250.

ADMIRAL WATSON.—Strike out all particulars.

ALAMO.—System, Marconi, 1,000; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

ALLIANCE.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

ANN ARBOR No. 3.—Hours, X.

ANN ARBOR No. 4.—Hours, X.

ANN ARBOR No. 5.—Hours, X.

ANTILLA.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

ATENAS.—System, National Electric Signaling Co., 1,000.

CAMDEN.—System, Marconi, 400; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

CARLOS.—Range, 500; system, Halcun, 240; W. L., 300, 500, 600. Note, Radio station operated and controlled by the Olson & Mahony Steamship Co., owner of vessel.

CHINA.—Notes, Radio station operated and controlled by the Marconi Co. China Mail Steamship Co., owner of vessel.

CITY OF ALPENA II.—System, Kilbourne & Clark, 120; W. L., 300, 450, 500, 600. Note, Radio station operated and controlled by the Detroit & Cleveland Navigation Co., owner of vessel.

CITY OF AUGUSTA.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

CITY OF DETROIT II.—System, Kilbourne & Clark, 120; W. L., 300, 450, 500, 600; hours, X. Note, Radio station operated and controlled by the Detroit & Cleveland Navigation Co., owner of vessel.

CITY OF GRAND RAPIDS.—Hours, X.

CITY OF MACKINAC II.—System, Kilbourne & Clark, 120; W. L., 300, 450, 500, 600. Note, Radio station operated and controlled by the Detroit & Cleveland Navigation Co., owner of vessel.

CITY OF ST. IGNACE.—System, Kilbourne & Clark, 120; W. L., 300, 450, 500, 600. Note, Radio station operated and controlled by the Detroit & Cleveland Navigation Co., owner of vessel.

CONGRESS.—Range, 150; system, Marconi, 480.

CORNING.—System, Marconi. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

CREOLE.—Range, 300; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

DE SOTO.—System, Marconi. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

FORT BRAGG.—Strike out all particulars.

FRIEDA.—Strike out all particulars.

GOVERNOR.—System, Marconi, 480.

GRACE DOLLAR.—Range, 100; system, Marconi, 480.

HOLLAND (WDW).—Hours, X.

HUMBOLDT.—System, Marconi, 240.

- MANCHURIA.**—Notes, Radio station operated and controlled by the Marconi Co. Atlantic Transport Co., owner of vessel.
- MARIPOSA.**—Strike out all particulars.
- MONGOLIA.**—Notes, Radio station operated and controlled by the Marconi Co. Atlantic Transport Co., owner of vessel.
- MUSKOGEE.**—System, Marconi. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- NACOOCHEE.**—Range, 300; system, Marconi, 1,000.
- NORTHLAND (WNX).**—Strike out all particulars.
- ONEGA.**—Hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PARAISO.**—Range, 200; system, Marconi, 480.
- PARISMINA.**—System, National Electric Signaling Co., 1,000.
- PERE MARQUETTE.**—W. L., 300, 500, 600; hours, X; service, limited commercial; strike out rates. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PERE MARQUETTE 17.**—W. L., 300, 500, 600; service, limited commercial; hours, X; strike out rates. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PERE MARQUETTE 18.**—W. L., 300, 500, 600; service, limited commercial; hours, X; strike out rates. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PERE MARQUETTE 19.**—W. L., 300, 500, 600; service, limited commercial; hours, X. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PERE MARQUETTE 20.**—W. L., 300, 500, 600; service, limited commercial; hours, X. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PETROLITE.**—System, Marconi, 1,000. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- PRESIDENT.**—System, Marconi, 240. Notes, Radio station operated and controlled by the Marconi Co. Pacific Coast Steamship Co., owner of vessel.
- PRINCETON (KST).**—System, Marconi, 1,000. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- PROTEUS (KKP).**—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- SAN MATEO.**—Range, 300; system, Wireless Specialty Apparatus Co., 1,000; service, PG; hours, X; rate 8 c. per word 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. San Mateo Steamship Corporation, owner of vessel.
- SIBERIA.**—Notes, Radio station operated and controlled by the Marconi Co. Atlantic Transport Co., owner of vessel.
- SILVER SHELL.**—Range, 400; system, Marconi, 1000; W. L., 300, 450, 600; service, PG; hours, X.
- SOUTH AMERICAN (KVW).**—Strike out all particulars.
- VANADIS.**—Note. Radio station operated and controlled by Morton F. Plant, owner of vessel (yacht).
- WESTERN STATES.**—System, Kilbourne & Clark, 120; W. L., 300, 450, 500, 600. Note, Radio station operated and controlled by the Detroit & Cleveland Navigation Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out particulars following the call signals KFF, KVW, WAW, WHP, WLH, and WNX.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

- BOSTON, MASS. (1XB).**—Strike out all particulars.
- MONTGOMERY, ALA.**—W. L., 500, 1650, 1800.
- SAN FRANCISCO, CAL. (6XH).**—W. L., 300, 600, variable.
- ST. DAVIDS, PA.**—W. L., 425, 500.

MISCELLANEOUS.

RADIO STATIONS OF THE UNITED STATES.

[Nov. 1, 1915.]

Government, commercial, and special land stations.

Controlled by—	General public.		Limited public.		Limited commercial.		Government, official.		Special. ¹		Total.	
	1914	1915	1914	1915	1914	1915	1914	1915	1914	1915	1914	1915
United States Navy.....	23	21	.....	1	.....	.....	25	33	.....	.....	48	55
United States Army.....	7	9	.....	.....	.....	.....	32	39	.....	.....	39	48
Philippine insular government.....	6	6	.....	.....	.....	.....	.....	.....	.....	.....	6	6
Marconi Co.....	58	45	3	4	1	10	.....	.....	.....	1	62	60
National Electric Signaling Co.....	1	2	1	.....	1	1	.....	.....	.....	.....	3	3
Tropical Radio Telegraph Co.....	2	2	.....	.....	.....	.....	.....	.....	.....	.....	2	2
Federal Telegraph Co.....	.....	3	6	4	2	1	.....	.....	.....	.....	8	8
Mutual Telephone Co. (Ltd.).....	3	3	2	.....	.....	2	.....	.....	.....	.....	5	5
Unclassified ²	5	7	.....	3	9	32	2	2	54	127	70	171
Total.....	105	98	12	12	13	46	59	74	54	128	243	358

Ship stations.

Controlled by—	Number.		Controlled by—	Number.	
	1914	1915		1914	1915
United States Navy.....	248	228	Alaska Steamship Co.....	.....	12
United States Coast Guard.....	25	24	Standard Oil companies.....	.....	11
United States Army.....	34	51	Pacific-Alaska Navigation Co.....	.....	5
United States Department of Commerce.....	6	7	Federal Telegraph Co.....	.....	5
Marconi Co.....	330	367	Atlantic Communication Co.....	15	3
National Electric Signaling Co.....	19	20	Unclassified ²	197	120
Tropical Radio Telegraph Co.....	21	21	Total.....	895	895
American-Hawaiian Steamship Co.....	.....	21			

¹ Including experimental and special amateur.² Includes individually operated stations.*Amateur stations.¹*

District and headquarters.	Number.		District and headquarters.	Number.	
	1914	1915		1914	1915
1. Boston, Mass.....	374	542	7. Seattle, Wash.....	114	203
2. New York, N. Y.....	503	636	8. Cleveland, Ohio.....	456	785
3. Baltimore, Md.....	543	682	9. Chicago, Ill.....	172	515
4. Savannah, Ga.....	39	54	Total.....	2,796	3,536
5. New Orleans, La.....	36	56			
6. San Francisco, Cal.....	562	343			

¹ To July 1.

Summary.

Kind of station.	Number.		Kind of station.	Number.	
	1914	1915		1914	1915
Government land stations.....	93	109	Government land and ship stations.....	406	419
Private, commercial, and private special land stations.....	150	249	Private commercial and private special stations, land and ship.....	732	834
Total.....	243	358	Total.....	1,138	1,253
Government ship stations.....	313	310	Amateur stations.....	2,796	3,836
Private commercial and private ship stations.....	582	585	Grand total.....	3,934	5,089
Total.....	895	895			

LOS ANGELES AMATEURS REPORTED FOR VIOLATIONS.

During a recent visit of V. Ford Greaves, radio engineer of the Bureau, and Ellery W. Stone, assistant radio inspector at San Francisco, the following Los Angeles amateur radio stations were found to be operating in violation of the radio act, and the cases have been referred to the United States district attorney for prosecution:

Hadys Hancock, Venice Pier, Venice, Cal., was found to be using a wave length in excess of 200 meters; maximum penalty, \$100.

Richard White, 435 Oakland Avenue, Pasadena, Cal., operating an amateur station without a license and using improper call letters; maximum penalty, \$100 fine and imprisonment for not more than two months.

Ernest Underwood, 903 Commercial Street., Inglewood, Cal., using a wave length in excess of 200 meters; maximum penalty, \$100.

George Vodra, 211 South Avenue, Los Angeles, Cal., using an amateur sending station without either station or operator's license; maximum penalty, \$100 and imprisonment for not more than two months.

Stuart Dalton, 121 East Twenty-third Street, Los Angeles, Cal., using a wave length exceeding 200 meters; penalty, \$100.

Harry Blodgett, 1953 Bonsallo Avenue, Los Angeles, Cal., using a transmitting station for some time without station or operator's license; maximum penalty, \$100 fine and imprisonment for two months.

METHOD OF CORRECTING LIST OF RADIO STATIONS OF THE UNITED STATES.

The following method of keeping the List of Radio Stations of the United States up to date by means of the Radio Service Bulletin is published for the information and guidance of those concerned:

The blank pages provided at the back of the List of Radio Stations should be numbered from 1 to 24.

The list of new stations published in the Radio Service Bulletin should be cut out and pasted on one of these blank pages.

The names and call letters of new stations should then be written on the margin of the proper page in the main list, with an arrow indi-

cating the proper alphabetical position. Following the name and call letter should be written the number of the page at the back of the book on which the particulars regarding the new station appear. This constitutes an alphabetical index to new stations.

The names of new stations should be written in the main list under the heading "Land and ship stations; alphabetically by call signals," showing the proper call signals as published in the bulletin. All of the call signals allotted to the United States are published in the list and followed by blanks for this purpose.

As there is not space in the main list in which to write changes concerning particulars of stations, the tables of alterations and corrections published in the bulletin should be cut and pasted on the blank pages provided at the back of the List of Radio Stations in such a manner as to permit the reading of both sides of a sheet thus inserted. Following the name of the station in the List of Radio Stations, the particulars of which have been altered, should be written the number of the page in the back of the book on which the changes may be found. Where the alterations and corrections affect only the Berne list the reference note may be omitted. The names of stations which have been discontinued or dismantled should be crossed out on the main list.

Corrections or changes in call letters should be written in the List of Radio Stations under the proper heading.

AMENDMENTS.

The Radio Laws and Regulations of the United States, edition of July 27, 1914, are hereby amended as follows:

Page 66, paragraph 149, should read:

Amateurs should write to the nearest examining officer in their vicinity (see pars. 134-145) for Form 756 "Application for operator's license," and to the radio inspector in their vicinity for Form 762 "Amateur applicant's description of apparatus."

Foreign-born applicants for station licenses must submit satisfactory evidence of their citizenship.

Page 67, paragraph 156, add the following sentence:

Licenses will not be signed by examining officers until the oath of secrecy has been properly executed.

Page 67, paragraph 160, last sentence should read:

Licenses held by them must be submitted to the examining officer.

Page 67, paragraph 161, should read:

Radio operators who pass the examination for a higher-grade license are required to submit their existing licenses to examining officers to be marked "Canceled."

Page 67, paragraph 162, should read:

Expired or canceled licenses will be returned to the licensees, marked "Canceled" or "Expired" in red across their faces, provided the particulars on Form 756, submitted herewith, are found correct by the examining officer. The service record shown on the reverse side of the license must be transcribed on Form 756.

Page 70, paragraph 175, should read:

Whenever practicable, the radio inspector shall satisfy himself on his visit before the departure of a steamer subject to the act of June 24, 1910, as amended July 23, 1912, that the radio apparatus is efficient and in good working order within the meaning of the act. If the apparatus does not comply with the law, the radio inspector will furnish the master with the stub of Form 771 "inspection record" on which will be noted the particulars in which the apparatus does not comply with the law. Where apparatus is found to be in compliance with the law, the stub of Form 771 will not be detached.

Page 70, paragraph 176, should read:

Masters of vessels entering a port of the United States and expecting to leave under the act of June 24, 1910, as amended July 23, 1912, should file Form 753a "Radio declaration" (Appendix A) in duplicate with the customs officer at the time of entry. The customs officer will furnish one copy to the radio inspector in order that proper inspection of the radio equipment may be made before departure.

Page 70, paragraph 177, should read:

For each departure of a steamer under the act of June 24, 1910, as amended July 23, 1912, the master is required to furnish to the customs officer a certificate in the form of Appendix B (Form 753b) "Master's certificate of radio apparatus." Such certificates shall be retained in the files of the collectors of customs. The collector of customs will arrange for the collection of these certificates at all times.

Page 75, Radio Service forms, Appendix A, should read:

Radio service Form 753a.

RADIO DECLARATION

(To be submitted in duplicate)

DEPARTMENT OF COMMERCE

BUREAU OF NAVIGATION

RADIO SERVICE

NOTICE.—“The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every willful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars.”—*Act of July 23, 1912.*

PORT OF.....

DATE....., 191

This is to certify that the.....
(Nationality.)

S. S.

of the.....
(Name of company or line.)

of which I am master, entered this port on....., 191 ,

having in crew persons and licensed or certified to
(Number.)

carry passengers; that the said vessel { is is not }*
(Number.)

equipped with radio apparatus as required by the act of June 24, 1910, as amended

July 23, 1912; that the radio station is in charge of..... properly licensed
(Number.)

radio operators and the apparatus is in { efficient inefficient }† condition.

.....
Master or Agent.

This form should be filed in duplicate with the collector of customs at time of entry, who will furnish one copy to the radio inspector of the district on the date of entry in order that proper inspection may be made of the radio apparatus prior to the clearance of the vessel.

* Strike out *is* or *is not* as the case may be.

† Strike out *efficient* or *inefficient* as the case may be.

Page 75 (Radio Service forms). The form number of Appendix B has been changed from 753 to 753b, the form remaining as heretofore.

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, January, 1916—No. 13

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1916.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

19746—15



NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations, published by the Berns bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Anderson ¹.....	.....	WZM	.....	U. S. Army.....	.....
Buckroe ¹.....	.....	WZL	.....	do.....	.....
Colorado Springs, Colo. ²	O 104 50 00	KIY	70	Clapp-Eastham.....	300, 400
Fort Caswell, N. C. ³	N 38 48 00	WUT	.....	U. S. Army.....	825

¹ Service, 0; radio station operated and controlled by the U. S. Signal Corps, War Department, Washington, D. C. School ship, located at Fort Monroe, Va.

² Service, limited commercial; hours, X; radio station operated and controlled by Herbert C. Colburn.

³ Service, 0; hours, 6m.-10s.; radio station operated and controlled by the U. S. Signal Corps, War Department, Washington, D. C.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berns bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Duchra* ¹	KGL	Marconi.....	300, 600	La Plata Steamship Co.
Eurana.....	KJG	do.....	300, 600	Walker, Armstrong & Co.
Munamar.....	KUI	Marconi.....	300, 600	Munson Steamship Line.
Orleanian ¹	KON	do.....	300, 600	R. Lawrence Smith (Inc.).
Virginia (KFR)* ¹	KFR	do.....	300, 600	Harby Steamship Co.

* Service, PG.

¹ Rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service, 8c. per word 80c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Cambridge, Mass.....	1XO	1 300, 600	P	X	General Radio Co.
Frankvale, Cal.....	6XN	1 300, 600	P	X	National Wireless Telephone & Telegraph Co.
Mendon, Ohio.....	8ZG	800, 425	P	X	Henry W. Campbell.
Newark, Ohio.....	8ZI	800, 425	P	X	Roy C. Burr.
Wesley, Ohio.....	8ZO	800, 425	P	X	Ross Gunn.
Salt Lake City, Utah.....	6ZV	800, 300, 425	P	X	Julian G. McCollom.
San Francisco, Cal.....	6XO	1 300, 600	P	X	National Wireless Telephone & Telegraph Co.

¹ Variable.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KFR	Virginia.....b	KUI	Munamar.....b
KGL	Duchra.....b	WUT	Fort Caswell, N. C.....b
KIY	Colorado Springs, Colo.....c	WZL	Buckroe.....b
KJG	Eurana.....b	WZM	Anderson.....b
KON	Orleanian.....b		

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XO	First district: Cambridge, Mass.		
6XN	Sixth district:	8ZG	Eighth district:
6XO	Fruitvale, Cal.	8ZI	Ironton, Ohio.
6ZV	San Francisco, Cal.	8ZO	Norwalk, Ohio.
	Salt Lake City, Utah.		Oberlin, Ohio.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name =Name of station.
 G. loc. =Geographical location: O=west longitude, N=north latitude.
 Call =Call letters assigned.
 System=Radio system used and sparks per second.
 Range =Normal range in nautical miles.
 W. L. =Wave lengths assigned: Normal wave lengths in italica.
 Service=Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P=Private.
 O=Government business exclusively.
 Hours =Hours of operation:
 N=Continuous service.
 X=No regular hours.
 m=a. m. (12m=midday).
 s=p. m. (12s=midnight).
 Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
 Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- AVALON, CAL.—System, Marconi, 240; W. L., 300, 530, 600.
 CAPE HATTERAS, N. C.—System, Marconi, 430; W. L., 300, 550, 600; service, PG and PR. Notes, Radio station operated and controlled by the Marconi Co. The station corresponds with a station at Virginia Beach, Va., when Weather Bureau's wire is out of order; rate, 1 c. per word 10 c. minimum per radiogram.
 KAWAHAE, T. H.—Service, limited commercial; strike out rates.
 LAHAINA, ISLAND OF MAUI, T. H.—Service, limited commercial; strike out rates.
 LIHUE, ISLAND OF KAUAI, T. H.—Service, limited commercial; strike out rates.
 OAKLAND, CAL.—Range, 150; system, Composite, 1,000.
 PHILADELPHIA, PA. (WHE).—Range, 100; system, Marconi, 240; service, PG and limited commercial.
 SAN LUIS OBISPO, CAL.—Strike out all particulars.
 WAHIAWA, ISLAND OF OAHU, T. H.—Service, PG.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- AL-KI.**—Range, 100; system, Marconi, 240.
BAYWAY.—System, Marconi, 1,000.
BRADFORD.—System, Marconi.
CHICAGO (WFI).—Hours, X.
CHRISTOPHER COLUMBUS.—Hours, X.
CITY OF ATLANTA.—System, Marconi, 1,000; W. L., 300, 450, 600.
COLORADO (KEA).—Strike out all particulars.
DACIA.—Strike out all particulars.
EASTLAND.—Strike out all particulars.
ELLINGTON.—Range, 40; system, Composite; W. L., 300, 600; service, 0; hours, 10m-10.30m, 9s-9.30s.
HILONIAN.—System, Marconi, 480.
LAQUA.—System, Marconi; Notes, Radio station operated and controlled by the Marconi Co. John A. McGregor, owner of vessel.
ILLINOIS (WCZ).—Hours, X.
LLAMA.—Strike out all particulars.
MINNESOTA (WEK).—Notes, Radio station operated and controlled by the Marconi Co. Northern Michigan Transportation Co., owner of vessel.
MOTANO.—System, Marconi, 1,000.
NANTUCKET.—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
NEVADA.—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 450, 500, 600; service, PG; hours, X; rate, 2 c. per word 20 c. minimum per radiogram. Note, Radio station operated and controlled by Goodrich Transit Co., owner of vessel.
NEW YORK (KSN).—System, Marconi, 480; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
PACIFIC (WRD).—Strike out all particulars.
PIONEER (WPM).—Call, WPN.
POWHATAN (KQY).—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word, 40c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
ROMA (WTE).—Name, Tamesi; system, Marconi. Note, Freeport & Tampico Fuel Oil Transportation Corporation, owner of vessel.
SOMERSET (KSU).—System, Marconi, 1,000.
VIGILANCIA.—Notes, Radio station operated and controlled by the Marconi Co. Marine Transport Service Corporation, owner of vessel.
WINDOM.—Name, Comanche.
ZAPORA.—Note, Radio station operated and controlled by the Booth Fisheries Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NRW, read Comanche b; WTE, read, Tamesi b; strike out particulars following the call signals, KDN, KEA, KGD, KSI, WFN, and WRD.

MISCELLANEOUS.

LOS ANGELES AMATEURS REPRIMANDED AND PENALIZED.

Upon a recent inspection trip made by V. Ford Greaves, radio engineer of the Bureau, and Ellery W. Stone, assistant radio inspector at San Francisco, a number of amateurs were reported for violation of the fifteenth regulation of the act of August 13, 1912, for using a wave length in excess of 200 meters, and the following action in these cases has been taken by the Secretary of Commerce:

V. M. Bitz, 825 West Fifty-third Street, Los Angeles, Cal., licenses suspended.

Mark B. Cosby, 356 Hobart Avenue, Los Angeles, Cal., licenses suspended.
 Stuart Dalton, 121 East Twenty-third Street, Los Angeles, Cal., penalty remitted.
 Hady's Hancock, Venice Pier, Venice, Cal., fined.
 Freeman High, 726 West Twenty-seventh Street, Los Angeles, Cal., licenses suspended.
 Horace Kemper, 1734 Loma Drive, Los Angeles, Cal., fined.
 Alfred McLaren, 534 West Forty-ninth Street, Los Angeles, Cal., licenses suspended.
 Ernest Underwood, 903 Commercial Street, Inglewood, Cal., fined.

John Bradley, 120 Julien Avenue, San Francisco, Cal., who was reported by the radio inspector at San Francisco for violation of sections 5 and 7 of the act of August 13, 1912, for the use of fraudulent call signals and interfering with the commercial traffic being handled by the Hillcrest station of the Marconi company and the steamship *J. A. Chanslor*, has been reprimanded by the Secretary of Commerce, and his licenses have been suspended.

LOS ANGELES AMATEURS REPORTED FOR VIOLATIONS.

In addition to the list of names given in Bulletin No. 12, the following amateurs were found to be operating stations without proper licenses, in violation of the radio act, and the cases have been referred to the United States district attorney for prosecution:

George Hawley, 1257 Cypress Avenue, Los Angeles, Cal.
 Jack Hyams, 1194 Spring Street, Los Angeles, Cal.
 Edmund Whiting, 1047 Mignonette Street, Los Angeles, Cal.

The maximum penalty for the above violation is \$500 fine and confiscation of the radio apparatus unlawfully used.

RADIO-SERVICE PERSONNEL.

Charles C. Kolster, assistant radio inspector at New York, N. Y., has been promoted to the position of radio inspector at New Orleans, La., to succeed Arthur R. Rice, who resigned on December 9, 1915. Harry Sadenwater, assistant radio inspector at New York, succeeds Mr. Kolster.

Charles Blankenship, assistant radio inspector at Chicago, Ill., has been transferred to the office of the chief radio inspector, New York, N. Y.

COMMERCIAL EXTRA FIRST-GRADE LICENSES.

The Department issues a special license, known as commercial extra first-grade, to radio operators whose trustworthiness and efficient service entitle them to confidence and recognition. These licenses are given consideration by the Civil Service Commission in examinations for positions requiring knowledge of radiotelegraphy, when experience is rated as a part of such examinations. Applicants for this grade of license must pass a special examination. To be eligible for this examination they must hold commercial first-grade licenses, and their certificates of skill in radio communication, issued under the act of June 24, 1910, or licenses under the act of August 13, 1912, must record 18 months' satisfactory commercial service at sea or at land stations, either or both, during the two years previous to the filing of the application for examination, as shown by indorse-

ment on the license service records, or other satisfactory evidence, and provided that the applicants have not been penalized for a violation of the radio laws and regulations. A speed of at least 30 words per minute, Continental Morse, and 25 words per minute, American Morse (five letters to the word), must be attained. The technical questions and the questions on the radio laws and regulations are considerably wider in scope than those for commercial first grade, and a higher percentage is required.

All examination papers, including the code test sheets, are marked and forwarded to the commissioner of navigation, with a recommendation by the radio inspector or examining officer. Examination papers are marked upon the basis of 100, and licenses are recommended only if 80 or better is attained.

During the past 18 months the Secretary of Commerce has issued commercial extra first-grade licenses to operators in the following order:

E. N. Pickerill, New York, N. Y.
H. Sadenwater, New York, N. Y.
R. R. Carlisle, San Francisco, Cal.
D. I. Moir, Seattle, Wash.
H. B. Herty, New Orleans, La.
E. M. Cadwell, New York, N. Y.
S. E. Miller, San Francisco, Cal.
C. A. Scott, Boston, Mass.
J. A. Worrall, New York, N. Y.
E. K. Oxner, Boston, Mass.
J. W. Swanson, New York, N. Y.
A. E. Gerhard, San Francisco, Cal.

G. A. Geare, Washington, D. C.
H. W. Sinclair, San Francisco, Cal.
J. H. Benson, Philadelphia, Pa.
E. W. Lovejoy, San Francisco, Cal.
Leo F. Whitehead, Boston, Mass.
W. J. Lynch, Brooklyn, N. Y.
F. E. Nickel, San Francisco, Cal.
J. W. Lee, Philadelphia, Pa.
R. B. Black, San Francisco, Cal.
Irving Ellingham, New York, N. Y.
James Maratta, Philadelphia, Pa.
Frank Orth, New York, N. Y.

PRICES OF BERNE PUBLICATIONS.

1. Official Nomenclature of Radiotelegraph Stations:

(a) Fourth edition, August, 1915 (English, French, or German), 3.60 francs per copy, postage not included; 4.90 francs per copy, postpaid.

(b) Supplements to the above list, issued monthly, 5 francs postpaid, for all supplements up to the end of the calendar year 1916.

2. Liste Alphabetique des Indicateurs d'Appel (alphabetical list of call letters):

(a) Third edition, July, 1913, 1.30 francs per copy, postage not included; 1.80 francs per copy, postpaid.

(b) Supplements to the above list to July 1, 1916, including back numbers, 4 francs, postpaid.

3. Conference of Berlin, 1906; 1 volume, 374 pages, 5 francs, postage not included.

4. Conference of London, 1912; 1 volume, 650 pages, 8 francs, postage not included.

5. International Radiotelegraphic Convention of London, with its Final Protocole and Service Regulations Attached; booklet of 35 pages, 40 centimes per copy, postage not included; 55 centimes, postpaid.

6. Extract of Service Attached to the London Convention; 5 centimes per copy, postage not included.

7. Time Signals and Meteorological Radiograms, Transmitted by the Eiffel Tower; 10 centimes per copy, postage not included; 15 centimes per copy, postpaid.

8. General Statistics of Radiotelegraphy; groups of publications relating to the situation on June 30, 1908, and during the years 1910 to 1913, inclusive, 35 centimes per fascicule, postpaid.

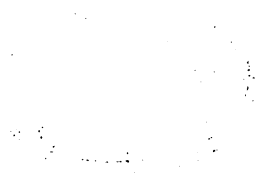
The above publications may be procured at the prices stated from the Director of the International Bureau of the Telegraph Union, Radiotelegraphic Service, Berne, Switzerland. Remittances should be made by means of international postal money orders.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, February, 1916—No. 14

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Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

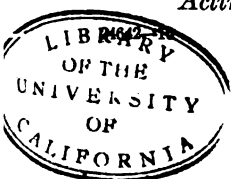
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Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.



NEW STATIONS.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Amazonia ¹	KOO	Marconi.....	300, 600	R. Lawrence Smith (Inc.).
Arctic ²	WLH	.....	300, 500, 600	Union Lumber Co.
Catania.....	WTI	Marconi.....	300, 600	Huasteca Petroleum Co.
Charles Pratt.....	KSU	do.....	300, 600	Standard Oil Co. of New Jersey.
Dade.....	KXU	do.....	300, 600	Miami Steamship Co.
Diana.....	KZM	do.....	300, 600	C. Ledyard Blair.
Floridian ³	WLR	Kilbourne & Clark, 240.	300, 450, 525, 600	American-Hawaiian Steamship Co.
Healdton.....	KOF	Marconi.....	300, 600	Standard Oil Co. of New Jersey.
Henry Williams.....	KRL	do.....	300, 600	Vacuum Oil Co.
Jacob Jones.....	NKG	do.....	300, 600	United States Naval Radio Service, Radio, Va.
Munwood.....	KUH	Marconi.....	300, 600	Munson Steamship Co.
New York (KUW).....	KUW	do.....	300, 600	Texas Co.
Santa Barbara ¹⁴	WBJ	do.....	300, 600	Atlantic & Pacific Steamship Co.
Texas (KUM).....	KUM	do.....	300, 600	Texas Co.

¹ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.

² Station operated and controlled by Higgins Steamship Co.

³ Range, 100; service, PG, hours X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram transoceanic service, 8 c. per word 80 c. minimum per radiogram. Station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.

⁴ Service, PG.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Columbia, Mo.....	9XQ	425, 800	P	X	University of Missouri.
Fall River, Mass.....	1ZF	200, 425, 600	P	X	Harold C. Bowen.
Lincoln, Nebr.....	9XT	300, 450	P	X	Thomas C. Rice.
Little Rock, Ark.....	5XO	1 685	P	X	Ed Cornish.
San Antonio, Tex. (5ZF).....	5ZF	300, 450, 600	P	(¹)	Sidney Friederich.
San Antonio, Tex. (5ZR).....	5ZR	200, 300, 450	P	(¹)	John C. Rodriguez.
Seattle, Wash. (7XZ).....	7XZ	1 600, 680	P	X	University of Washington.
Worcester, Mass.....	1YK	(¹)	P	X	Worcester Polytechnic Institute.

¹ Variable.

² 8 p. m. to 11.30 p. m.

³ 8.15 p. m. to 11.30 p. m.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1YK	First district:	7XZ	Seventh district: Seattle, Wash.
1ZF	Worcester, Mass.	9XQ	Ninth district:
	Fall River, Mass.	9XT	Columbia, Mo.
5XO	Fifth district:		Lincoln, Nebr.
5ZF	Little Rock, Ark.		
5ZR	San Antonio, Tex. (5ZF).		
	San Antonio, Tex. (5ZR).		

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Call signal.	Name.	Call signal.	Name.
KOF	Healdton.	KXU	Dade.
KOO	Amazona.	KZM	Diana.
KRL	Henry Williams.	NKG	Jacob Jones.
KSQ	Charles Pratt.	WBJ	Santa Barbara.
KUH	Munwood.	WLH	Arctic.
KUM	Texas.	WLR	Floridian.
KUW	New York.	WTI	Catania.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in *italics*.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P=Private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne Bureau.]

ANDERSON.—Notes, Radio station operated and controlled by Coast Artillery Corps, United States Army, Washington, D. C. Training school station, Coast Artillery School, located at Fort Monroe, Va.

BENTON HARBOR, MICH.—Range, 60; system, Marconi, 120.

BUCKROE.—Notes, Radio station operated and controlled by Coast Artillery Corps, United States Army, Washington, D. C. Training school station, Coast Artillery School, located at Fort Monroe, Va.

ENSENADA, P. R.—Hours, week days, 8m-12m, 2s-5s; Sundays, 9m-12m.

JACKSONVILLE, FLA.—Hours, 6m-8m, 10m-1s, 4s-7s.

KVICHAK, ALASKA (KML).—Name Alockanok River, Alaska. Note, Station limited to correspondence with ship and shore stations of the North Alaska Salmon Co.

KVICHAK, ALASKA (KMT).—Name, Hales Creek, Alaska; service, P. Note, Station limited to correspondence with ship and shore stations of the North Alaska Salmon Co.

SEATTLE, WASH. (KPE).—Range, 200; system, Kilbourne & Clark, 240. Notes, Rate, PG, 6 c. per word 60 c. minimum per radiogram.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne Bureau.]

- ASTRAL.**—Change name to Standard II.
- BREAKWATER.**—System, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, North Pacific Steamship Co., owner of vessel.
- CAMINO.**—Note, Barber & Co., owner of vessel.
- CITY OF COLUMBUS.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- COAMO.**—Note, W. L., 300, 450, 600.
- COLON (WHO).**—Strike out all particulars.
- COLUMBIA (KYM).**—Strike out all particulars.
- COMAL.**—System, Marconi, 1,000; W. L., 300, 450, 600; Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EURANA.**—(Incorrectly spelled "Eruana," in list of ship stations, alphabetically by names of vessels, in Bulletin No. 13.) Notes, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.
- FINLAND.**—System, Marconi, 480. Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- GARGOYLE.**—Range, 300; system, Marconi, 1,000; service, PG, hours, X. Notes, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.
- MOHAWK (KVM).**—System, Marconi, 1,000; W. L., 300, 450, 600. Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MUNAMAR.**—Range 200; system, Marconi, 480; service, PG; hours, N; Munson Steamship Co., owner of vessel. Notes, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.
- NEW YORK (KNK).**—Strike out all particulars.
- OCEANA.**—Strike out all particulars.
- OWERA.**—Strike out all particulars.
- PARAGUAY.**—System, Marconi, 400; hours, X. Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PHILADELPHIA (KSM).**—System, Marconi, 240. Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PILOT BOY.**—Strike out all particulars.
- PONCE.**—System, Marconi, 1,000; W. L., 300, 450, 600. Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- ROANOKE.**—System, Marconi, 400.
- ROSE CITY.**—System, Marconi, 400.
- ST. PAUL (KSO).**—System, Marconi, 480. Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- SANDY HOOK.**—Strike out all particulars.
- SAN RAMON.**—Note, Parr-McCormick Steamship Line, owner of vessel.
- SANTA CLARA (WRS).**—Strike out all particulars.
- SUWANNEE.**—Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- TAMESI.**—Notes, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.
- TATOOSH.**—Note, Anacortes Fisheries Co.
- TEXAS (KUR).**—Change name to Georgia.
- VIGILANCIA.**—Note, Roger L. Farnum, owner of vessel.
- WAPAMA.**—Note, Wapama Steamship Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KML, *read* Alockanok River, Alaska c; KMT, *read* Hales Creek, Alaska c; KSA, *read* Standard II b; KUR, *read* Georgia b; strike out all particulars following the call signals KNJ, KNK, KNV, KPL, KYM, KZG, WHO, and WRS.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

ILLIOPOLIS, ILL.—Strike out all particulars.

NEW BEDFORD, MASS.—Strike out all particulars.

SPRINGFIELD, ILL.—W. L., 600, 1800.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out 1ZO and 9ZK.

MISCELLANEOUS.

PORTUGUESE GOVERNMENT ERECTS RADIO STATION.

Information has just been received from Vice Consul Ramon I. Janer, at Lisbon, to the effect that the Portuguese Government has recently constructed a building near Leixoes (Oporto) for the purpose of installing a radio station, and that the apparatus is to be installed shortly.

THE SAFETY-FIRST EXHIBIT.

The several departments of the Government are arranging a "safety-first" exhibit, to be held in the New National Museum Building, Washington, D. C., during the week beginning February 21, 1916. In connection with the exhibit the Bureau of Navigation Radio Service will display a complete radio set and the various instruments used by radio inspectors in connection with the enforcement of the radio laws. The public is invited to attend this exhibit.

SAGAPONACK STATION CLOSED.

The Sagaponack station of the Marconi company, located at Long Island, N. Y., has been temporarily closed. However, the name of this station should not be stricken from the list unless information to that effect appears in a subsequent bulletin.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, March, 1916—No. 15

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E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. STREET,

Acting Secretary.



NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Metha Nelson (schooner) ¹	O 158 28 00 N 58 45 00	KMP	20	Composite, 100...	300,500,600
Navassa Island ²	O 74 52 00 N 18 30 00	WQN	.....	.....	.....

¹ Service, limited, commercial; hours, X. Radio station operated and controlled by Alaska Packers' Association. The vessel is moored in Bristol Bay, Alaska, and communicates with stations as Nushagak (KMG) and Clark's Point, Alaska.

² Radio station operated and controlled by Snare & Triest Co.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Arborean.....	WLS	Marconi.....	300,600	American-Hawaiian Steamship Co.
Artisan.....	WKW	do.....	300,600	Do.
H. H. Rogers.....	KSI	do.....	300,600	Standard Oil Co. of New Jersey.
Joseph Pulitzer ¹	WPZ	Kilbourne & Clark, 240.	300,450, 525,600	Port of Portland.
Pearl Shell.....	WIC	Marconi.....	300,600	Pearl Shell Steamship Co.
Ravalli ²	WGI	do.....	300,600	Pacific Coast Steamship Co.
Yaguez ³	KDY	Marconi, 1,000.....	300,450, 600	Vacuum Oil Co.

¹ Range, 75; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Port of Portland, owner of vessel.

² Range, 100; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

³ Range, 200; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDY	Yaguez..... b	WKW	Artisan..... b
KMP	Metha Nelson (schooner)..... c	WLS	Arborean..... b
KSI	H. H. Rogers..... b	WPZ	Joseph Pulitzer..... b
WGI	Ravalli..... b	WQN	Navassa Island..... c
WIC	Pearl Shell..... b		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Dallas, Tex.....	5ZC	200, 300, 425...	P	X	Frank M. Corlett.
Kansas City, Mo. (9YU)....	9YU	200, 300.....	P	X	Field Company A, Signal Corps, National Guard of Missouri.
La Grande, Oreg.....	7ZH	200, 300, 425...	P	X	Orland M. Heacock.
Leonia, N. J.....	2ZE	200, 325.....	P	X	Paul F. Godley.
Minneapolis, Minn. (9ZM)...	9ZM	200, 425.....	P	X	Marc Frazer.
Montclair, N. J.....	2ZI	200, 325.....	P	X	Adams-Morgan Co.
New Bedford, Mass.....	1ZN	200, 300, 425, 600	P	(1)	Milton A. Baylies.
Pullman, Wash.....	7YI	500, 1,750.....	P	X	State College of Washington.
State College, Pa.....	8XE	Variable.....	P	(2)	Pennsylvania State College.
Waco, Tex.....	5YG	200, 300, 600, 1,625.	P	X	E. T. Genheimer.

¹ Hours, continuous during day and from 6s to 9s.² Hours, 7s to 10.30s.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1ZN	First district: New Bedford, Mass.	7YI	Seventh district: Pullman, Wash.
2ZI	Second district: Montclair, N. J.	7ZH	La Grande, Oreg.
2ZE	Leonia, N. J.	8XE	Eighth district: Pennsylvania State College.
5YG	Fifth district: Waco, Tex.	9YU	Ninth district: Kansas City, Mo. (9YU).
5ZC	Dallas, Tex.	9ZM	Minneapolis, Minn. (9ZM).

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc.=Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P=Private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.**LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.**

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- AKUTAN, ALASKA.**—G. loc., 0 165° 48' 00'', N 54° 08' 00''; range, 25; W. L., 300, 500, 600; hours, X.
- GALVESTON, TEX.**—Service, PG and special; rates, PG, 6 c. per word, 60 c. minimum per radiogram; special, 6 c. per word, 60 c. minimum per radiogram (for correspondence with Heald Bank Lightship); for vessels reported by the lightship \$1 for each report. Note, Press dispatches and special service with Heald Bank Lightship conducted on the 500-meter wave length.
- HOBOKEN, N. J.**—W. L., 2,240; service, limited commercial.
- JUALIN, ALASKA.**—G. loc. (approximate), 0 135° 00' 00'', N 58° 56' 00''; range, 100; system, Marconi, 120; W. L., 300, 450, 600, 1,600; service, limited commercial; hours, X. Note, Radio station operated and controlled by Jualin Mines Co.
- JUNEAU, ALASKA.**—G. loc. (approximate), 0 134° 25' 00'', N 58° 19' 00''.
- PREMIER (moored schooner).**—Strike out all particulars.
- SOUTH WELFLEET, MASS.**—System, Marconi, 233 and 240; hours, X.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- ADVANCE.**—W. L., 300, 450, 600.
- APACHE (KVA).**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- ARGYLL (WTB).**—Range, 150; system, Federal Poulsen Arc, 250; W. L., 300, 600, 1,800; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co.
- BRABANT.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service 8 c. per word 80 c. minimum per radiogram.
- CATANIA.**—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- CHINA.**—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600. Note, China Mail Steamship Co., owner of vessel.
- CITY OF EVERETT.**—Note, Radio station operated and controlled by Atlantic Communication Co.
- DELAWARE SUN.**—System, Marconi, 400; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EDNA.**—Strike out all particulars.
- EL ALBA.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EL NORTE.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EURANA.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- FLORIDIAN.**—Range, 300; system, Marconi, 1,000; W. L., strike out 525; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- GARGOYLE.**—W. L., 300, 450, 600.
- GEORGIA (KUR).**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

- GLENPOOL.**—W. L., 300, 450, 600; hours, X.
GOLD SHELL.—Range, 250; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
HARVARD.—System, Federal Poulsen Arc, 360; W. L., 300, 600, 1,800; rates, 4 c. per word 40 c. minimum per radiogram.
KLAMATH.—System, Marconi, 400.
LYMAN STEWART.—Range, 150; system, Federal Poulsen Arc, 250; W. L., 300, 600, 1,800.
MONTEREY (KWY).—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
NEWPORT (WWH).—Range, 150; system, Marconi, 480.
NUECES.—Hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram.
OLEUM.—Range, 150; system, Federal Poulsen Arc; W. L., 300, 600, 1,800; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co.
PONCE.—Hours, X.
SAN PABLO.—Strike out all particulars.
SAN PEDRO.—Strike out all particulars.
SANTA BARBARA.—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
SANTA CRUZ.—Strike out all particulars.
SANTA MARIA (WTF).—Range, 150; system, Federal Poulsen Arc, 250; W. L., 300, 600, 1,800; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co.
SATSUMA.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
SIERRA.—Range, 150; system, Federal Poulsen Arc, 360; W. L., 300, 600, 1,800; rates, 8 c. per word, 80 c. minimum per radiogram.
SONOMA (WHM).—System, Federal Poulsen Arc, 360; W. L., 300, 600, 1,800. Note, Radio station operated and controlled by Federal Telegraph Co.
STANLEY DOLLAR.—Strike out all particulars.
SULTANA.—Strike out all particulars.
TEXAS (KUM).—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
TOLEDO.—System, Marconi, 400; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
VENTURA.—Range, 150; system, Federal Poulsen Arc, 360; W. L., 300, 600, 1,800; rates, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co.
WILHELMINA.—System, Marconi, 1,000; W. L., 300, 450, 600.
YALE.—System, Federal Poulsen Arc, 360; W. L., 300, 600, 1,800; rates, 4 c. per word, 40 c. minimum per radiogram.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals KLW, KLX, KMP, KZH, WPA, WSD, and WSP.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

- AGRICULTURAL COLLEGE, N. D.**—W. L., 300, 500, variable.
CANAL DOVER, O.—W. L., 200, 450.
CINCINNATI, O (8ZF).—W. L., 200, 425.
GRAND FORKS, N. D.—W. L., 1,500, variable.
HAMILTON, O.—W. L., 200, 300, 425.
LOS ANGELES, CAL. (6XL).—W. L., 600, variable.

NORTHAMPTON, MASS.—W. L., 200, 300, 425, 600. Note, Radio station operated and controlled by Dean A. Lewis and G. C. Sabin.
ST. LOUIS, MO. (9XC).—W. L., 700, 825; service, P; hours, X.
SAN FRANCISCO, CAL. (6XD).—Strike out all particulars.
SLINGERLANDS, N. Y.—W. L., 300, 400, 550, 600, 1,000.
SPRINGFIELD, O.—W. L., 200, 300, 450.
WHEELING, W. VA.—W. L., 200, 450.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out 6XD (San Francisco, Cal.).

MISCELLANEOUS.

CHANGES IN PERSONNEL.

R. B. Woolverton, radio inspector at San Francisco, Cal., has resigned, effective March 1, 1916, and V. Ford Greaves, radio engineer, will take charge of the San Francisco district temporarily.

CUTTYHUNK ISLAND RADIO STATION ALLOWED TO OPERATE.

The United States Coast Guard has entered into an agreement with Chester Veeder granting him permission to operate his radio station at Cuttyhunk Island under the supervision of the Coast Guard. Mr. Veeder will be allowed the privilege of communicating with amateur stations for practice, or for other purposes, using his amateur call letters, provided the same is not commercial business, and provided the wave length used is 200 meters or lower and does not interfere with commercial or Government radio stations. The superintendent of the Naval Radio Service has assigned the call letters "NSA" to this station when it is operating as a Government station.

RADIO COMMUNICATION CHARTS TO BE ISSUED GRATIS.

The superintendent of the Naval Radio Service announces that, commencing with March, a complete communication chart will be issued to the public gratis upon request. This chart includes the various merchant vessels in North and South American trade, the time and date they may be reached by radio, the coastal stations through which the traffic should be routed, and rates for radio land-line service.

KEY WEST NAVAL RADIO STATION OPEN TO COMMERCIAL TRAFFIC.

The Naval Radio Service has requested the Bureau to issue instructions to operators on all ships to the effect that the Key West station is open to commercial traffic and handles ships' position reports, which are forwarded to the New York Herald not later than 8 p. m. daily.

SPANISH INVENTION OF IMPROVED RADIOGRAM RECEIVER.

El Imparcial, one of the leading dailies of Madrid, states, under date of January 24, 1916, that the Minister of Public Works, after examination and report by the Centro Tecnico de Aeronauticos (a bureau

of the ministry), has approved a radiogram receiver of a type that does away with earpieces. It is said that the radius of the new apparatus is in excess of 5,000 kilometers (the kilometer being the equivalent of about $\frac{1}{8}$ mile), and that it is contemplated to institute radiographic service between Spain and the United States.

ACCESSIONS TO LONDON RADIOTELEGRAPHIC CONVENTION.

The following countries have, since June 28, 1915, acceded to the International Radiotelegraphic Convention signed at London on July 5, 1912: Bolivia, October 13, 1915; Peru, July 12, 1915.

AMENDMENTS.

The Radio Laws and Regulations of the United States, edition of July 27, 1914, are hereby amended as follows:

Page 56, parenthetical clause, lines two and three, paragraph 63, should read:

SEC. 4, fifteenth regulation, act of August 13, 1912.

WIRELESS AS A SAFEGUARD TO LIFE AT SEA.

[The marine disasters described below are in addition to those listed in a publication of the Bureau of Navigation, Radio Service, entitled "Important Events in Radiotelegraphy," dated Feb. 1, 1916.]

1909.

June 10.—Steamship *Slavonia* stranded off Azores. Marconi operator, Stanley Coles, summoned aid by wireless and 410 lives were saved.

1910.

September 9.—Pere Marquette Car Ferry *No. 18* sank in middle of Lake Michigan. The SOS call was heard by Ludington wireless station and steamer *Pere Marquette No. 17*. Latter rescued four passengers and two of crew. All others lost their lives, including wireless operator, S. S. Sczpanck.

1911.

November 22.—Steamship *Prinz Joachim* struck rocks at Atwood Bay, Samana Islands. Wireless communication, established direct with New York City, resulted in the saving of all on board.

1912.

February 22.—Steamship *Madison* rammed by steamship *Hippolyt Dumois*. Wireless was the means of saving the entire crew and all the passengers.

April.—Steamship *Denver* in collision with steamship *El Sud* off Galveston Bar. *El Sud* not equipped with wireless, but assistance was sent to *El Sud* in response to *Denver's* calls, and the wrecked vessel was towed into Galveston.

August 16.—Steamship *Pleiades* ran ashore in Magdalena Bay. Operator G. Bennett summoned aid by wireless and all were saved.

December 5.—Steamship *Easton*, of the United States & Dominion Transportation Co., struck on Iroquois Reef, Lake Superior. Wire-

less calls were answered by stations at Port Arthur, Ontario, and Duluth, Minn. Tugs were sent to assistance of stranded steamer in answer to wireless calls and the *Easton* was released with slight damage.

1913.

April.—The *Robert Dollar* while crossing the Columbia River bar struck heavily but could not locate any damage and proceeded on her voyage to Japan. When 100 miles offshore her stern post and rudder broke off close up to her counter and dropped into the ocean, leaving her helpless in a rough sea and a high wind. Communication with shore was established by radio and a tug was sent to assistance of the helpless steamer.

June 13.—Steamship *Yukon* struck reef off Alaskan coast and sank. The radio operators summoned aid by wireless and all were saved.

June 19.—Steamship *Riverside* wrecked and sank off California coast. Wireless was instrumental in saving the lives of all on board.

1914.

August 17.—Steamship *Prince Albert* ran ashore on Butterworth Rocks during dense fog. Assistance was summoned by wireless and all passengers and crew were saved.

August 25.—Steamship *Admiral Sampson* sank after collision with the steamship *Princess Victoria* off Point No Point, near Seattle, Wash. Eight lives were lost. SOS sent out by *Princess Victoria* was picked up by a radio station in Seattle and also by the steamship *Admiral Watson*. A tug was sent from Seattle to the assistance of the *Admiral Sampson*.

September 1.—Steamship *City of Chicago* was reported on fire 12 miles out from Chicago. Wireless was utilized and the ship returned safely to port.

September 18.—Steamship *Francis H. Leggett* sank 60 miles south of Columbia River. The radio station at Astoria, Oreg., intercepted a message to that effect which had evidently been sent from a foreign cruiser to a Canadian station. The Astoria station notified all ships in the vicinity to look for survivors. Two persons were rescued.

October 11.—The steamship *Almirante*, of the United Fruit Co., stranded at Cartagena Harbor; 66 passengers and 90 persons in crew. No lives lost.

October 15.—Steamship *Metapan* rammed and sunk by *Iowan* at the entrance of Ambrose Channel, New York. SOS was answered by vessels in various parts of the harbor.

November 10.—Steamship *Lakeland* ran ashore 8 miles from Alpena. Radio operator sent out distress signals which were answered by shore stations at Cleveland, Buffalo, and Tobermory. The tug *Favorite* was informed and went to *Lakeland's* assistance. Constant communication was maintained between the tug and the distressed vessel.

November 23.—Steamship *Hanalei* struck on reef near Bolinas, Cal. SOS answered by radio station at San Francisco, revenue cutter *McCulloch*, oil tankers *El Segundo* and *Richmond*. Heavy seas and reefs prevented their going to assistance of the distressed vessel which was slowly being pounded to pieces. The wireless cabin was washed away, but Operator Lovejoy established communication with

shore by means of pocket flashlight and directed work of rescue. Forty-three persons were saved.

December 30.—Steamship *Colorado* became disabled off Little Egg Harbor, N. J.; crew of 35; no loss of life. In answer to wireless calls, tugs brought vessel into New York.

1915.

January 10.—Steamship *Mexicano*, Pierce Navigation Co., ran ashore on Tampico, Mexico, Breakwater. The radio operator sent out wireless distress calls, which were answered by Mexican Government station at Tampico. The vessel was floated by tugs.

January 26.—Steamship *Washingtonian* sank after collision with schooner *Elizabeth Palmer* off Delaware Breakwater. All the crew arrived in the ship's boats on the Fenwick Island lightship, from which vessel wireless messages were sent to the steamship *Hamilton*, which stopped and took the wreck victims to New York.

February 4.—Steamship *Colon* stranded off bar at Topolobampa. SOS call answered by U. S. S. *Maryland*, *Korrigan III*, and the U. S. S. *Annapolis*. Passengers and crew were transferred to the *Maryland* and the *Annapolis*.

February 4.—The oil tanker *Chester*, though not equipped with wireless, attracted the attention of the American liner *Philadelphia* by sending the SOS on Morse lights. The radio operator of the *Philadelphia* established communication by this means and 33 men were rescued from the sinking ship.

March 25.—The steamship *Parisian* grounded in Mississippi River. While in this position she was struck, on March 27, by the steamship *Heredia*, of the United Fruit Co. Wireless brought prompt aid to the two distressed vessels.

March 27.—The steamship *Heredia* struck the steamship *Parisian*. (See above.) The *Heredia* had 164 passengers aboard.

April 1.—Steamship *Mexico*, Pacific Steam Navigation Co., ran aground near Southwest Pass, La. Wireless was instrumental in bringing tugs to float vessel.

April 14.—The steamship *Seminole* wrecked off Yuma Bay. Wireless was utilized, but passengers reached shore safely before rescuing vessels arrived.

April 21.—Steamship *San Zeferno* grounded in Galveston Harbor; crew of 40 aboard. Wireless was used to report, but vessel was found to be in no danger.

May 7.—The steamship *Asuncion* ran ashore off Fraser River. Wireless was utilized in summoning tugs to her assistance.

June 16.—Steamship *Alabama* was struck by steamship *Delaware* 53 miles south of Scotland lightship in dense fog. Neither vessel, however, was badly damaged. Wireless was used to notify owners.

July 2.—Steamship *Panuco* grounded at entrance to South Pass, La.; crew of 35 aboard. Wireless used to bring prompt aid to float vessel.

August 23.—Steamship *Metapan* grounded in Cartagena Harbor. There were 45 passengers and 19 in crew. The cargo was promptly discharged into lighters and steamer subsequently floated.

September 13.—Steamship *Sant Anna*, of the Fabre Line, was on fire in midocean, latitude 40° 23' north, longitude 47° 30' west. The SOS call brought the *Ancona*, which took off 600 persons and

conveyed the distressed vessel to port. The *Sant Anna* carried 1,700 persons in addition to the crew.

November 9.—Steamship *Lievatta* (Italian), loaded with cased kerosene and gasoline, caught fire 65 miles east of Sabine Bar, Tex. Reported by wireless by steamship *Gulfstream*, which vessel stood by the burning steamer until other assistance, summoned by wireless, arrived from Port Arthur and Galveston. Without the assistance thus secured the vessel and cargo would have been a total loss.

December 1.—Steamship *Flamenco* ran aground at South Pass, La. The accident was reported by wireless and rescue soon followed.

December 13.—Steamship *Antilla* collided with a barge beached off Sea Gate. Wireless was instrumental in saving the cargo.

1916.

January 17.—Car ferry *Pere Marquette No. 19* ran aground 4 miles north of Ludington, Mich., at 7.30 p. m. Wireless communication was established with Ludington and Pere Marquette car ferries *No. 17* and *No. 18*, which were advised not to come in close on account of shoal water. Wireless communication was maintained throughout salvage operations.

January 22.—Steamship *Centralia*, when off Columbia River, broke her rudder and the heavy seas washed away deck load and flooded the engine and wireless rooms. The aerial was carried away, but repaired by the operator, Earl Diamond, who then called SOS. The call was immediately answered by steamships *Governor*, *Adeline Smith*, *Yosemite*, *Admiral Schley*, *Eurana*, and land stations at Marshfield and Eureka. Weather and sea finally moderated and the ship made San Francisco without assistance.

February 1.—Steamship *Tapata Maru* was in collision with the steamship *Silver Shell*. SOS was answered by radio stations at Boston and Cape Race and various steamers. The crew was rescued by the *Silver Shell*.

February 7.—Steamship *Caloria*, of the Standard Oil Transportation Co., ran aground at the head of South Pass, La. A number of tugs and lighters responded to the SOS call and the 31 persons on board the wrecked vessel were rescued.

February 25.—The steamship *Cretan*, of the Merchant & Miners' Line, collided with an unknown vessel off Diamond Shoals, and was thereby rendered a helpless wreck. The 27 passengers aboard were safely transferred to the tramp steamer *Dorothy* which was towed into port by the Coast Guard cutter *Onondaga*, the vessel responding to the *Cretan's* wireless call for help.

February 26.—The French auxiliary cruiser *Provence II* (so designated to distinguish her from French battleship *Provence*) was torpedoed and sunk in the Mediterranean Sea. French and British patrol boats, which were summoned by wireless, rescued 870 persons.

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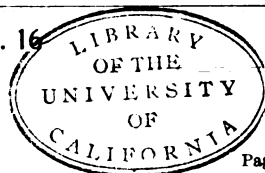
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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, April, 1916—No. 16



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WASHINGTON, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

34202—16

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	System.	Station controlled by—
Inglewood, Cal.....	KFZ	Federal Poulsen Arc.	Federal Telegraph Co.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Admiral Watson ¹	WAW	Kilbourne & Clark, 240.	300, 450 525, 600	Pacific-Alaska Navigation Co.
Barge No. 1.....	WQA	Marconi.		Inland Navigation Co.
Buccaneer ²	KFO	do.	300, 600	Freeport & Tampico Fuel Oil Transportation Co.
Curacao.....	WGW		300, 600	Pacific Coast Co.
Ecuador.....	WBN			Pacific Mail Steamship Co.
Fred'k Luckenbach.....	KGW	Marconi.	300, 600	Edgar F. Luckenbach.
La Brea ³	WON	Federal Poulsen Arc.	300, 600	Union Oil Co.
Lakeport.....	WDJ	Marconi.	300, 600	Port Huron & Duluth Steamship Co.
Lakewood.....	WDK	do.	300, 600	Do.
Suruga.....	WGD	do.	300, 600	Barber & Co. (Inc.).
Tormentor ²	KFN	do.	300, 600	Freeport & Tampico Fuel Oil Transportation Co.
Venezuela.....	WBG			Pacific Mail Steamship Co.

¹ Range, 150; service, PG; hours, N; rates, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by Pacific-Alaska Navigation Co., owner of vessel.

² Note, Radio station operated and controlled by Marconi Co.

³ Range, 130; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[h=ship stations: c=land station.]

Call Signal.	Name.	Call signal.	Name.
KFN	Tormentor.....	WDJ	Lakeport.....
KFO	Buccaneer.....	WDK	Lakewood.....
KFZ	Inglewood, Cal.....	WGD	Suruga.....
KGW	Fred'k Luckenbach.....	WGW	Curacao.....
WAW	Admiral Watson.....	WON	La Brea.....
WBG	Venezuela.....	WQA	Barge No. 1.....
WBN	Ecuador.....		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Columbia, Mo. (9YS).....	9YS	300, 375	P	X	University of Missouri.
Fayetteville, Ark.....	9YM	300, 400	P	X	University of Arkansas.
Richmond Hill, N. Y.....	22V	300, 3500	P	X	Alfred H. Grebe.
University Place, Nebr.....	9YD	300, 468	P	X	Nebraska Wesleyan University.
Westbrook, Me.....	12Q	200, 300, 425, 600	P	X	Wm. H. Rocheleau.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1ZQ 2ZV	First district: Westbrook, Me. Second district: Richmond Hill, N. Y.	9YD 9YM 9YS	Ninth district: University Place, Nebr. Fayetteville, Ark. Columbia, Mo. (9YS.)

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name = Name of station.

G. loc. = Geographical location: O=west longitude, N=north latitude.

Call = Call letters assigned.

System = Radio system used and sparks per second.

Range = Normal range in nautical miles.

W. L. = Wave lengths assigned: Normal wave lengths in *italics*.

Service = Nature of service maintained:

PG=General public.

PR=Limited public.

P=private.

O=Government business exclusively.

Hours = Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates = Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes = Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

MOBILE, ALA.—System, Marconi, 400; W. L., 300, 445, 600.

TAMPA, FLA.—W. L., 300, 510, 600; hours, 7m-10s.

VICTOR, COLO.—W. L., 575.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ANCON.—W. L., strike out 500; Note, Radio station operated and controlled by Panama Railroad Co., owner of vessel.

ALASKA.—Range, 150; W. L., 300, 450, 525, 600; hours, X. Note, Radio station operated and controlled by Alaska Steamship Co., owner of vessel.

ARAPAHOE.—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

AROLINE.—Range, 150; system, Marconi, 240. Note, Pacific-Alaska Navigation Co. owner of vessel.

- ARTISAN.**—Range, 250; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- BEAR.**—Range, 150.
- BRINDILLA.**—Range, 300; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CAROLINA (KGB).**—W. L., 300, 450, 600.
- CAROLINIAN.**—(Name formerly *Southerner*); range, 150; system, Marconi, 240; hours, X. Notes, Radio station operated and controlled by Marconi Co. Export Leaf Tobacco Co., owner of vessel.
- CHARLES PRATT.**—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- CITY OF MACON.**—Name changed to *Macona*.
- EL MUNDO.**—System, Marconi, 480; hours, X; rates, North and South American service, 4 c. per word 40 c. per minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- GEORGIAN.**—System, Marconi, 480.
- GOVERNOR COBB.**—Range, 200; system, Marconi, 400; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- HARVARD.**—System, Haller-Cunningham, variable; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- HAVANA.**—W. L., 300, 450, 600.
- HERMOSA.**—Range, 150; system, Marconi, 120; W. L., 300, 500, 600; service, PR (limited to correspondence between East San Pedro and Avalon, Cal., and steamship *Cabrillo*); hours, X; rates, 1 c. per word 10 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- HURON.**—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- LARIMER.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- LURLINE.**—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600.
- LENAPE.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MACONA.**—(Name formerly *City of Macon*); Note, Barber & Co. (Inc.), owner of vessel.
- MADISON.**—Range, 300; system, Marconi 1,000; W. L., 300, 450, 600; rates, North and South American service 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MASCOTTE.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Peninsular & Occidental Steamship Co., owner of vessel.
- MATSONIA.**—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600.
- MIAMI (KOZ).**—Range, 150; service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Peninsular & Occidental Steamship Co., owner of vessel.
- MUNWOOD.**—Range, 200; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Notes, Radio station operated and controlled by Marconi Co. Munson Steamship Co., owner of vessel.
- NEVADA.**—System, Marconi, 120.
- NORTH AMERICA.**—Strike out all particulars.
- OLSON & MAHONY.**—Name changed to *Providencia*.
- PLATURIA.**—Range, 200; system, Marconi 240; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram.
- PRINCESS ANNE.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PROVIDENCIA.**—(Name formerly *Olson & Mahony*); call WIK; range, 200; system, Composite, 375; W. L., 300, 600; service, PG, hours, X; rates 2 c. per word 20 c. minimum per radiogram. Notes, Radio station operated and controlled by Golden Gate Transport Co. Olson & Mahony, owner of vessel.

RAVALLI.—System, Marconi, 150; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram. transoceanic service, 8 c. per word 80 c. minimum per radiogram.

RELAY.—Hours, X.

SARATOGA (KWS).—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service 4 c. per word 40 c. minimum per radiogram.

SIXAOLA.—System, Composite, 1,000.

SOUTHERNER.—Name changed to *Carolynian*.

S. O. Co. No. 91.—Range, 100; system, Marconi, 240.

S. O. Co. No. 93.—Range, 100; system, Marconi, 240.

WILLIAM CHATHAM.—Range, 500; system, Haller-Cunningham, variable; W. L., 300, 525, 600. Note, Radio station controlled by Steamer William Chatham Co., (Inc.), owner of vessel.

YALE.—System, Haller-Cunningham, variable; W. L., strike out 1,800; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signal KRU.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

AUBURN, N. Y.—Hours, 9m-9.30m, 2s-2.30s, and on Monday, Wednesday, and Friday, 7s-7.30s.

COLUMBIA, Mo. (9XQ).—Radio station operated and controlled by University of Missouri (department of physics).

ST. LOUIS, Mo. (9XY).—Call 9XY; W. L., 300, 750, 1,000.

SCHENECTADY, N. Y. (2XA).—W. L., 500, 800, variable.

MISCELLANEOUS.

ATLANTA RADIO CLUB.

The following letter which has been received by the Bureau is published in full because of the spirit of cooperation manifested therein:

COLLEGE PARK, GA.,
January 13, 1916.

DEAR SIR: I would like to give you a few facts about the Atlanta amateurs. As president of the Atlanta Radio Club, it is my duty to see that you do not get a mistaken impression of us.

I have one of the oldest stations in this section and have watched with much interest the increase of the number during the last two years. At first I could hear only one or two amateurs. The number commenced to grow, and soon interference became a problem. By this time most of us knew each other and, being congenial, we decided to meet together and discuss our problems.

There were about 10 of us to start with. We secured the use of one of the small anterooms of the Carnegie Library Building and there held our first few meetings. The club grew rapidly. The small room was soon so crowded that we had to seek larger quarters. Several of our number who were members of the local Y. M. C. A. obtained permission to use a large room on the third floor of the 10-story building. We have held our meetings there on alternate Saturday nights since last summer. A temporary aerial has been erected on top of the building and we use it for receiving tests.

After our constitution was drafted we proceeded to draw up a set of operating rules. These rules consisted of the Government Radio Service regulations and a few which dealt with the local conditions. In addition to the usual club officers we elected a club radio inspector, whose duty it is to enforce these regulations. It is also his duty to visit each station once every 60 days for the purpose of suggesting improvements.

We decided that the objects of our club should be to promote interest in radio communication and to increase knowledge and operating efficiency. To promote

these objects, we have decided to rate each member according to the percentage he makes on competitive examinations to be held every three months. These examinations will be very similar to the Government examinations as given to operators. They will consist of questions on the radio laws and regulations, questions on the theory and operation of the apparatus, and an operating speed test. We believe that by creating a spirit of rivalry among the members the interest will be stimulated and operating efficiency increased.

We want you to understand that Atlanta is as alive "wirelessly" as she is in other respects. During "electrical prosperity week" last December we were invited to enter an exhibit in the electrical show. We realized that this was beyond the scope of the average wireless club, and quite an undertaking for so young an organization. However, after discussing the matter we decided that it would be beneficial both to ourselves and to the public at large. Luckily we were allotted a space right beneath a skylight. Some of our energetic and enterprising members obtained permission and erected an aerial on top of the 17-story building on the ground floor of which the show was held. Thus it was that we were able to have a station in actual operation in the exhibit. Several of the boys were always present to explain the mysteries of wireless to the eager spectators. Taken altogether, the venture was a glorious success. The Atlanta newspapers all gave us good writeups and we secured many new members.

The probable reason for the late start of wireless in this vicinity is that there are no Government or commercial stations within 250 miles of Atlanta. In order to hear anything at all the first amateurs had to have comparatively large aërials and very sensitive instruments. Until recently these instruments were beyond the reach of all but the wealthy experimenters. (It is a curious fact that I have noticed that rich amateurs are few and far between.)

As we are so far beyond the zone of interference, most of us use transmitting waves somewhat over the limit prescribed by the Government. We do this knowingly, but we feel that we are still obeying the spirit of the law, which is to prevent interference with Government and commercial stations. If we had the faintest idea that we were causing interference we would immediately cut down our waves. We will not allow any member to use power enough to reach the coast under any conditions unless he either uses a short wave or else has a special license.

As to our loyalty to the United States, we hope that we are not less loyal than the most patriotic citizen in the whole land. We are planning to put our loyalty into practical use. We expect in the near future to form a volunteer signal corps and to practice field work under as near actual war conditions as possible. In the meantime we can be depended upon to discover and report any unneutral or unfriendly station which might attempt operation in this vicinity.

Hoping this may be of service to you, I beg to remain,

Very truly, yours,

FRANCIS F. MERRIAM.

TAHITI RADIO STATION OPENED.

The radio station erected by the French Government at Haapape, or Mahina, near Venus Point, Island of Tahiti, was declared open to receive and transmit commercial messages on December 28, 1915.

Communication with the United States will be via Samoa, and Awanui, New Zealand, thence by cable to San Francisco. The rates have not yet been established nor has the station been assigned call letters. All messages during the time of the war (sent or received) must be in French, or if in English should be accompanied by the translation. A strict censorship is exercised and code messages are not accepted.

It is not expected that the cost per word to the United States via the route indicated above will be over \$1, and it is hoped that some arrangement may be made to transmit messages via Tutuila to Honolulu and thence to San Francisco. The all-wireless route just referred to would reduce the cost per word more than one-half and would insure a saving of time.

The present installation of 10 kilowatt, with a wave length of 600 meters, can easily maintain communication with Tutuila. After

the completion of the larger station of 300 kilowatt, with a wave length of 2,500 meters, direct communication with Honolulu will be easily maintained, and even San Francisco, Sydney, and the French West Indies are expected to be reached.

The official designation of the new station has not yet been decided. It has been suggested that it should be known as the Haapape, or the Mahina, or the Point Venus Radio Station, but it is expected that the minister of war, in establishing the rates, will officially bestow the name of the Tahiti Radio Station.

The station is situated at a point some 10 miles from Papeete, and a telegraph line has been stretched between it and the post office at Papeete and the postmaster will be in charge of all messages after they have undergone the scrutiny of the censor. The completion and operation of a wireless plant has placed this colony in direct communication with the rest of the world and the business houses are now no longer dependent on the monthly mail service.

PROPOSED WIRELESS-TELEPHONE INSTALLATION IN SPAIN.

In continuation of a report dated February 1, the consul at Seville, Spain, transmits information based on an article published in the Liberal of that city, giving further details of the proposed wireless-telephone installation at that place.

The proposal contemplates stations in all of the principal cities of Spain and the adjacent Spanish territory in Africa, the Balearic Islands, the Canary Islands, and the islands of Tenerife and the Grand Canaries, with apparatus installed on the various Spanish coasting and ocean vessels.

It is said that stations of the first class (having a power of 5 kilowatts) are to be installed in Seville, Cadiz, and Cordoba in this consular district, and at Madrid, Bilbao, Ciudad Real, Cuenca, Siguenza, Valladolid, Zaragoza, Logrona, Leon, Lugo, Granada, Lerida, Gijon, Coruna, Vigo, Malaga, Almeria, Alicante, Valencia, Barcelona, in other parts of Spain, and at Tangier, Mellilla, Palma de Mallorca, and Las Palmas in Spanish possessions, a total of 27 stations of the first class.

Stations of the second class (having a power of 2 kilowatts), six in all, are to be established at Huelva in this district, and at Larache, Ceuta, Ibiza, Ciudadela, and Tenerife.

The object of the stations is to transmit wireless-telephone messages (similar to the telephone messages now transmitted over the land lines in Spain), or when desired that parties may talk with either parties direct.

The first class, which are called "Radiotelefonemas" are to have a special tariff exactly the same as that now fixed for the land lines of Spain, with a rebate of one-half for deferred messages, and the same rebate on press messages.

In the second class, known as "Conferencias radiotelefonicas," the rates are to be for three minutes, or fraction thereof, according to distance:

Up to 100 kilometers, 0.75 peseta (approximately 15 cents).

From 100 to 200 kilometers, 1.25 pesetas.

From 201 to 300 kilometers 0.50 peseta additional, with an additional 50 centimos (approximately 10 cents) for each additional 100 kilometers.

For communication with vessels the tariff is to be 0.15 additional for each word of "Radiotelefonemas," without regard to distance. For "conferences" the price is to be computed by the land distance to the nearest station to the vessel, with an addition of 2 pesetas for each three minutes of conversation, without regard to the distance the message may be carried over the sea.

The stations of the first class are to be always open, and those of the second class from 8 in the morning until 10 at night.

CHARGING PANEL FOR STORAGE BATTERY FOR THE OPERATION OF EMERGENCY LIGHTS ON PASSENGER VESSELS.

In compliance with the regulations of the Steamboat-Inspection Service of the Department of Commerce, requiring auxiliary lights on passenger vessels, a number of such vessels at Baltimore, Md., have been equipped with emergency lights, using storage battery as the auxiliary source of power.

In order that the storage battery be properly charged, a charging panel board has been designed by Radio Inspector R. Y. Cadmus, of the Department of Commerce, which apparently meets these requirements. The board is so equipped as to automatically disconnect the charging circuit when the battery has been charged. Should the lights be used for purposes other than emergency, the sangamometer can be set so as to cut out these lights when the discharge reaches a certain point, thereby reserving the necessary emergency supply.

The board is equipped with overload and underload automatic switches, to prevent excessive charging or charging from reversed polarity.

The board is simple in construction and comparatively inexpensive.

In the event of an accident requiring the use of the lights, this is accomplished by the officer or wheelman on the bridge throwing one switch or pressing a push button on the steering head of the wheel.

The lights are placed in the main passageways, the passageways leading to the staterooms, over the doors leading to the decks, on the stairways leading to the lifeboat decks, on the boat deck in immediate vicinity of lifeboats and rafts, and to the signal lights of the vessel.

The above lights are arranged on three circuits, one for each deck, leading to the charging panel. These circuits consist of two parallel wires run through a lead cable, and the lamps connected in parallel or across the parallel wires; therefore, should one of the lamps get broken, the circuit is not interrupted. On the freight deck 3-ampere fuses are used; on the passenger deck 5-ampere fuses are used; and on the boat deck 10-ampere fuses are used. In the event of an accident, should the water reach the freight deck circuit, the 3-ampere fuses will blow, resulting in the lights on the decks above becoming more brilliant.

AMATEUR OPERATORS' LICENSES SUSPENDED.

The radio inspector, customhouse, Boston, Mass., has reported to the Bureau violations of the radio laws by amateurs in his district, resulting in the suspension of their license privilege by the Secretary of Commerce for periods of from one to three months:

Two at New Haven, Conn., reported for operating a radio station without a license for the station and without having an operator's license; licenses suspended for one month and two months, respectively.

One at Stoneham, Mass., reported for using profane and abusive language in transmitting messages; license suspended for three months.

The operators mentioned above have been notified that should they be reported for other violations of the radio laws, such leniency may not be shown them by the department.

AMATEUR PENALIZED.

An amateur radio operator at Stamford, Conn., has been indicted in the United States District Court at New Haven, Conn., for violation of sections 1, 2, and 3 of the act of August 13, 1912, entitled "An act to regulate radio communication."

The jury reported a verdict of guilty, charging the defendant with operating a radio station without a license for the station, and also without having an operator's license, and a penalty was imposed by Judge Thomas.

COMMERCIAL EXTRA FIRST-GRADE LICENSES.

During the months of February and March the Secretary of Commerce has issued commercial extra first-grade licenses to the following operators: Arthur Griffiths, William O'Connor, Fred Muller, and James B. Barriette.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, May, 1916—No. 17

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WASHINGTON, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

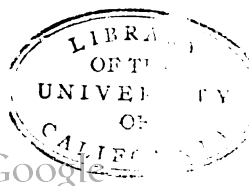
The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.



NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Range.	Wave lengths.	Service.	Hours.	Station controlled by—
Anchorage, Alaska ¹	NZY					Alaska Engineering Commission.
Chignik, Alaska ^{2,3}	KHC	200	300, 500 600, 1610	(12)	X	Alaska Packers' Association.
Clarks Point, Alaska ^{2,4}	KHG	200	300, 400, 500, 600	(12)	X	Do.
Koggilung, Alaska (KHB). ^{2,5}	KHB	200	300, 400, 500, 600	(12)	X	Do.
Koggilung, Alaska (KVV). ^{2,6}	KVV	100	300, 450, 600	(12)	X	Alaska Fishermen's Packing Co.
Earsen Bay, Alaska ^{2,7}	KHA	200	300, 500, 600, 1610	(12)	X	Alaska Packers' Association.
Naknek, Alaska (KHT). ^{2,8}	KHT	200	300, 500, 600, 1610	(12)	X	Do.
Port Moller, Alaska ¹⁰	KWR	150	300, 450, 600, 1610	PG	(11)	Pacific-American Fisheries.
Snag Point, Alaska ^{2,12}	KHF	200	300, 400, 500, 600	(12)	X	Alaska Packers' Association.

¹ System, Kilbourne & Clark.

² Note, Radio station open from approximately April to October each year.

³ G. loc. (approximate), O 158° 31' 30", N. 56° 17' 30"; system, Kilbourne & Clark, 1,000. Note, Radio station communicates with United States naval station at Kodiak, Alaska, and Alaska Packers' Association stations at Larsen Bay and Naknek, Alaska.

⁴ G. loc. (approximate), O 154° 31' 30", N. 58° 50' 45"; system, Kilbourne & Clark, 120. Note, Radio station communicates with stations of the Alaska Packers' Association at Snag Point, Naknek, and Kvichak, Alaska, and vessels of the association.

⁵ G. loc. (approximate), O 157° 00' 00", N. 59° 02' 30"; system, Kilbourne & Clark, 120. Note, Radio station communicates with stations of the Alaska Packers' Association at Naknek, Snag Point, and Clarks Point, Alaska, and vessels of the association.

⁶ Station is in operation from approximately July 1 to Aug. 20.

⁷ G. loc. (approximate), O 156° 55' 00", N. 59° 00' 00"; system, Kilbourne & Clark, 120.

⁸ G. loc. (approximate), O 153° 59' 40", N. 57° 37' 30"; system, Kilbourne & Clark, 1,000. Note, Radio station communicates with stations of the Alaska Packers' Association at Chignik, and Naknek, Alaska, and with the United States naval station at Kodiak, Alaska.

⁹ G. loc. (approximate), O 157° 00' 00", N. 58° 43' 30"; system, Kilbourne & Clark, 1,000. Note, Radio station communicates with United States naval stations at Kodiak, St. Paul, and Dutch Harbor, Alaska, and the vessels and land stations of the Alaska Packers' Association.

¹⁰ G. loc. (approximate), O 160° 40' 00", N. 59° 50' 00"; system, Kilbourne & Clark, 1,000.

¹¹ Hours, 8.30 a. m. to 12 m., 1 to 5 p. m., and other hours when business warrants.

¹² G. loc. (approximate), O 158° 27' 15", N. 59° 02' 30"; system, Kilbourne & Clark, 120. Note, Radio station communicates with stations of the Alaska Packers' Association at Naknek, Clarks Point, and Kvichak, Alaska, and with vessels of the association.

¹³ Service, limited commercial.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KGW	D. N. Luckenbach.....b	KSW	Royal Arrow.....b
KHA	Larsen Bay, Alaska.....c	KUG	Munplace.....b
KHB	Koggilung, Alaska, KHB.....c	KUK	Munsomo.....b
KHC	Chignik, Alaska.....c	KVV	Koggilung, Alaska, KVV.....b
KHT	Snag Point, Alaska.....c	KWR	Port Moller, Alaska.....c
KHG	Clarks Point, Alaska.....c	NZZ	L. Roscoe.....c
KHT	Naknek, Alaska, KHT.....c	NZY	Anchorage, Alaska.....c
ALA	Acme.....b	WBH	Colombia.....b
RIQ	Astral.....b	WCU	Conneaut.....b
KNS	Sucrosa.....b	WCV	The Limit.....b
KNT	Mielero.....b	WDH	Petoskey.....b
KNV	Cubadist.....b	WNU	Anne W.....b
KPK	Starlite.....b	WOL	Los Angeles.....b
KPL	Moonlite.....b	WRP ¹	Dauntless.....b
KPO	Twillite.....b	WRP ¹	Defiance.....b
KPP	Dawnlite.....b	WRP ¹	Fearless.....b
KPQ	Sunlite.....b	WRP ¹	Hercules.....b
KPR	Daylite.....b	WRP ¹	Sea Rover.....b
KSV	Standard Arrow.....b	WSU	Republic.....b

¹ This call is interchangeable among the following tugs (one set of apparatus only being used): Dauntless, Defiance, Fearless, Hercules, and Sea Rover.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Acme ^{1, 2, 3}	KIJ	Marconi	300, 450, 600	Standard Transportation Co.
Astral ^{1, 2, 3}	KIQ	do	300, 450, 600	Do.
Anne W	WMU	do	300, 600	Hosford Transportation Co.
Colombia	WBH	do	300, 600	Pacific Mail Steamship Co.
Conneaut ^{2, 4}	WCU	do	300, 600	Wyandotte Transportation Co.
Cubadist ^{2, 3}	KNV	do	300, 600	Cuba Distilling Co.
Dauntless ^{1, 5}	WRP ⁶	Haller-Cunningham impulse excited. ¹³	300, 600	Ship Owners & Merchants' Tugboat Co.
Dawnlite	KPP	Marconi	300, 600	Standard Oil Co. of New Jersey.
Daylite	KPR	do	300, 600	Do.
Defiance ^{1, 7}	WRP ⁶	Haller-Cunningham impulse excited. ¹³	300, 600	Ship Owners & Merchants' Tugboat Co.
D. N. Luckenbach ^{2, 3}	KGW	Marconi	300, 600	Edgar F. Luckenbach.
Fearless ^{1, 8}	WRP ⁶	Haller-Cunningham impulse excited. ¹³	300, 600	Ship Owners & Merchants' Tugboat Co.
Hercules ^{1, 9}	WRP ⁶	do	300, 600	Do.
Los Angeles ^{1, 2, 10}	WOL	Federal Poulsen Arc. 300.	300, 600 1800	Federal Telegraph Co.
L. Roscoe	NZX	Kilbourne & Clark		Alaskan Engineering Commission.
Mieler ^{2, 3}	KNT	Marconi	300, 600	Cuba Distilling Co.
Moonlite	KPL	do	300, 600	Standard Oil Co. of New Jersey.
Munplace ^{1, 2, 3}	KUG	do	300, 600	Munson Steamship Co.
Munsomo ^{1, 2, 3}	KUK	do	300, 600	Do.
Petoskey ^{2, 11}	WDH	do	300, 600	Chicago & South Haven Steamship Co.
Republic	WSU	do		John A. Hooper.
Royal Arrow ^{1, 2, 3}	KSW	Marconi	300, 450, 600	Standard Transportation Co.
Sea Rover ^{1, 12}	WRP ⁶	Haller-Cunningham impulse excited. ¹³	300, 600	Ship Owners & Merchants' Tugboat Co.
Sucrosa ^{2, 3}	KNS	Marconi	300, 600	Cuba Distilling Co.
Standard Arrow ^{1, 2, 3}	KSV	do	300, 450, 600	Standard Transportation Co.
Starlite	KPK	do	300, 600	Standard Oil Co. of New Jersey.
Sunlite	KPQ	do	300, 600	Do.
The Limit	WCV	do		Whitney Bros. Co.
Twilight	KPO	do	300, 600	Standard Oil Co. of New Jersey.

¹ Service, PG.

² Note, Radio station operated and controlled by Marconi Co.

³ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

⁴ Rates, 2 c. per word 20 c. minimum per radiogram.

⁵ Range, 100; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Ship Owners & Merchants' Tugboat Co., owner of vessel.

⁶ This call is interchangeable among the following tugs (one set of apparatus only being used): Dauntless, Fearless, Defiance, Hercules, and Sea Rover.

⁷ Range, 100; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Ship Owners & Merchants' Tugboat Co., owner of vessel.

⁸ Range, 100; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Ship Owners & Merchants' Tugboat Co., owner of vessel.

⁹ Range, 100; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Ship Owners & Merchants' Tugboat Co., owner of vessel.

¹⁰ Range, 200; hours, X. Note, Radio station operated and controlled by Federal Telegraph Co.

¹¹ Rates, 2 c. per word 20 c. minimum per radiogram.

¹² Range, 100; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Ship Owners & Merchants' Tugboat Co., owner of vessel.

¹³ Sparks per second, variable.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Bozeman, Mont.	7ZD	200, 425.	P	X	R. Earl Dawes.
Indianapolis, Ind.	9YK	200, 450.	P	X	James E. Weyant.
Lacey, Wash.	7YS	300, 450, 600.	P	X	St. Martin's College.
Little Rock, Ark. (5XF).	5XF	Variable.	P	X	Arthur R. McCreary.
Media, Pa.	3X	300, 400, 600.	P	X	Simon Delbert, jr.
Cxford, Ohio.	8YR	200, 425.	P	X	Miami University.
Philadelphia, Pa. (3XP).	3XP	300, 400, 600.	P	X	Simon Delbert, jr.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
3XO	Third district: Media, Pa.	7YS	Seventh district: Lacey, Wash.
3XP	Philadelphia, Pa. (3XP).	7ZD	Bozeman, Mont.
5XF	Fifth district: Little Rock, Ark. (5XF).	8YR	Eighth district: Cxford, Ohio.
		9YK	Ninth district: Indianapolis, Ind.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name = Name of station.

G. loc. = Geographical location: O=west longitude, N=north latitude.

Call = Call letters assigned.

System = Radio system used and sparks per second.

Range = Normal range in nautical miles.

W. L. = Wave lengths assigned: Normal wave lengths in italics.

Service = Nature of service maintained:

PG=General public.

PR=Limited public.

P=private.

O=Government business exclusively.

Hours = Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates = Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes = Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co. = Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

CHIGNIK, ALASKA.—Strike out all particulars.

CLARKS POINT, ALASKA.—Strike out all particulars.

DENVER, COLO.—W. L., 300, 575; service, limited commercial; hours, X. Note, This station limited to communication with the following stations: Ajax Gold Mining Co., Victor, Colo., and H. C. Colburn, Colorado Springs, Colo.

FORT MORGAN, ALA. (WFM).—Range, 200; system, Marconi, 400; W. L., 300, 445, 600. Note, In addition to hours previously published, station is also in operation from 9.40 a. m. to 9.50 a. m., daily.

KARLUK, ALASKA.—Strike out all particulars.

KOGGIUNG, ALASKA.—Strike out all particulars.

NAKNEK, ALASKA (KHT).—Strike out all particulars.

NUSHAGAK, ALASKA (KHF).—Strike out all particulars.

PASSAGRILLE, FLA.—G., loc. (approximate), 0 82° 44' 16'', N. 27° 40' 53''; range, 50; system, composite, 250; W. L., 300, 435, 600; service, PG; hours, X (this station also communicates with a land station (WIX) at St. Petersburg, Fla., the hours of operation being as follows: 8m–11m, 1s–5s, 7.30s–8s); rates, for communication with ships (cable count) per word 4 c. minimum per radiogram of 15 words 60 c., for communication with St. Petersburg, Fla. (not cable count), 10-word day message 35 c., additional words 2 c. each, 10-word night message 25 c., additional words 1 c. each, 50-word day letter 53 c., each additional 10 words or less one-fifth of initial rate, 50-word night letter 35 c., each additional 10 words or less one-fifth of initial rate.

PHOENIX, ARIZ.—Range, 300; system, Federal Poulsen arc; W. L., 3,000, 3,400; service, limited commercial; hours, 6m–6s, local standard time; rates, per radiogram of 15 words 50 c., additional words 3 c. each (domestic count). Note, This station is limited to communication with the Federal Telegraph Co.'s station at Los Angeles (KEX), Cal.

ST. PETERSBURG, FLA.—System, composite, 500; W. L., 300, 395, 600; service, limited commercial; hours, 8m–11m, 1s–5s, 7.30s–8s; rates (not cable count), 10-word day message 35 c., additional words 2 c. each, 10-word night message 25 c., additional words 1 c. each, 50-word day letter 53 c., each additional 10 words or less one-fifth of initial rate, 50-word night letter 35 c., each additional 10 words or less one-fifth of initial rate. Note, This station limited to correspondence with a land station (WRG) at Passagrille, Fla.

TAMPA, FLA.—W. L., 300, 510, 600; hours, 6m–8m, 10m–1s, 4s–7s (time of the meridian 90° west of Greenwich).

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ARBOREAN.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

ARDMORE.—System, Marconi.

BALBOA.—Strike out all particulars.

BARGE No. 1.—Name changed to *Inco No. 1*.

BUCCANEER.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

CHESTER W. CHAPIN.—System, Fessenden, 260; W. L., 300, 550, 600.

CONCHO.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

CONCORD.—System, Fessenden, 260; W. L., 300, 550, 600.

CONSTABLE HOOK.—(Name formerly *Henry Williams*); rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

- CURACAO.**—System, Marconi; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- DADE.**—Note, Radio station operated and controlled by Marconi Co.
- DIANA.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- ECUADOR.**—System, Marconi; W. L., 300, 600.
- EL OCCIDENTE.**—System, Marconi, 400; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EL ORIENTE.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EL SOL.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EL SUB.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- FRED'K. LUCKENBACH.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- GALATEA.**—Rates, 2 c. per word 20 c. minimum per radiogram.
- GARGOYLE.**—Range, 200; W. L., 300, 450, 600.
- GREAT NORTHERN.**—W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- HENRY WILLIAMS.**—Name changed to *Constable Hook*.
- HEWITT.**—(Name formerly *Pacific, KIL*). Note, Radio station operated and controlled by Union Sulphur Co., owner of vessel.
- H. H. ROGERS.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- ILLINOIS (KTH).**—System, Marconi, 1,000; W. L., 300, 450, 600.
- INCO No. 1.**—Name formerly *Barge No. 1*. Rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- IROQUOIS (KVF).**—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- J. A. CHANSLOR.**—System, Federal Poulsen arc. Note, Radio station operated and controlled by Federal Telegraph Co.
- JOHN A. HOOPER.**—System, Marconi, 480.
- LA BREA.**—Range, 300; W. L., 300, 600, 1,800.
- LAKEPORT.**—Rates, 2 c. per word 20 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- LAKEWOOD.**—Rates, 2 c. per word 20 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- LEXINGTON (KNB).**—W. L., 300, 550, 600.
- MANOA.**—System, Marconi, 1,000; W. L., 300, 450, 600.
- MASCOTTE.**—Range, 150; hours, N; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- MATINICOCK.**—System, Marconi; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- MEDINA.**—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MIAMI (KOZ).**—Hours, N; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- NECHES.**—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

- NEVADA.—System, Marconi, 480; W. L., 300, 600. Note, Radio station operated and controlled by Marconi Co.
- NEW HAMPSHIRE (KXF).—System, Fessenden, 260; W. L., 300, 550, 600.
- NEW HAVEN (KXN).—System, Fessenden, 260; W. L., 300, 550, 600.
- NEW YORK (KUW).—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- NORTHERN PACIFIC.—Range, 150; W. L., 300, 465, 600.
- PACIFIC (KIL).—Name changed to *Hewitt*.
- PEARL SHELL.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. per radiogram. Note, Radio station operated and controlled by Marconi Co.
- REMLIK.—Note, Radio station operated and controlled by Willis S. Kilmer, owner of vessel.
- SANTA CATALINA.—Range, 200.
- SANTA CECILIA.—Range, 200.
- SANTA CRUZ (WPA).—Strike out all the particulars.
- SANTIAGO.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; hours, N.
- SENATOR BAILEY.—System, Composite, 1,000; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Notes, Radio station operated and controlled by Marconi Co.; Gulf Refining Co., owner of vessel.
- STANDARD.—System, Marconi.
- SURUGA.—Call, KGD; range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- TORMENTER.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- VENEZUELA.—System, Marconi; W. L., 300, 600.
- VIRGINIA (KFR).—Note, Gaston, Williams & Wigmore Steamship Corporation, owner of vessel.
- WESTWEGO.—System, Marconi, 1,000; W. L., 300, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- YAGUEZ.—W. L., 300, 450, 600.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all the particulars following the call signals: KHA, KHB, KHC, KHF, KHG, KHT, and WHU.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

- ALAMEDA, CAL.—Strike out all the particulars.
- BURLINGTON, IOWA.—Note, Radio station operated and controlled by William W. Peters (Burlington High School).
- CHICAGO, ILL.—Strike out all the particulars.
- HARTFORD, CONN. (1ZT).—W. L., 200, 300, 425, 600; hours, X.
- NORWALK, OHIO.—Strike out all the particulars.
- OVERLIN, OHIO.—Strike out all the particulars.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all the particulars following the call signals: 6XS, 8ZI, 8ZO, and 9YH.

MISCELLANEOUS.**CHILEAN WIRELESS SERVICE.**

In view of the fact that the press has lately spoken of opening the Chilean radiotelegraphic stations for commercial use, information was requested of the Director General of Telegraphs by the commercial attaché at Santiago as to the actual state of affairs. Under date of March 2 he replied:

The radiotelegraph stations have not been opened for public service because there are some which are not yet connected with the land lines and are also lacking in certain details which will be necessary for putting them into service. This office will advise you as soon as they are opened for use. I am sending you herewith a copy of the proposed tariff and other information which you have indicated a desire to know.

A translation of portions of the decree opening the wireless stations of Chile to public service, to which the director general refers in the above note, is as follows:

Whereas, there have been established in the country several radiotelegraphic stations and some of them are united to the land lines of the State Telegraph; and

Whereas, it would appear that these offices should be utilized by the public and in view of the facts presented by the Director General of Telegraphs, acting in accordance with the Director General of the Navy.

I decree that the Director General of Telegraphs shall take charge of the telegraphic service of the radiotelegraph stations and all details relating to the public service, collection of tariffs, and the relations which this country may have with other countries or administrations. The Navy will have charge in future of everything connected with the personnel, apparatus, and actual service of the radiotelegraphic stations.

Second. The radiotelegraphic offices will be opened to the public service from time to time, as the Director General of Telegraphs may announce, beginning with the offices which are now connected with the existing land lines.

The respective charges in the service of wireless interchange, in accordance with the international convention, will be:

- (a) To a coast station, 60 centimes of a franc (11.58 cents U. S.).
- (b) To a station on board a ship, 40 centimes (7.72 cents).
- (c) Land service, 10 centimes (1.93 cents).
- (d) Intermediary transit charges from coast or ship stations, and charges fixed for any special services requested by sender.

Fourth. In making collections for aerograms from the offices of the State Telegraphs, the following rates will be charged:

- (a) Aerograms sent to ships via station on the Chilean coast, 5.50 gold pesos (\$2 U. S.) for the first 10 words and 0.55 gold peso (\$0.20) for each additional word.
- (b) For radiotelegraphic exchange between the coast offices which are on the Chilean coast, 4 Chilean paper pesos (fluctuating value, \$0.15 to \$0.18) for the first 10 words, and 40 centavos Chilean paper currency for each additional word.
- (c) For the radio telegrams which are sent to any offices of the State Telegraph land lines from Chilean ships of war by the personnel of these warships, whether officials or members of the crew, 2 paper pesos for the first 10 words and 20 centavos for each additional word.

(d) If it is necessary for a radiotelegram to pass over lines or stations of other administrations or companies, there will be collected in addition to the rates mentioned the charges corresponding to such lines or stations.

(e) Radio telegrams for the press will be given the advantage of a discount of 50 per cent of the indicated tariffs, provided they comply with the respective regulations.

Fifth. For the present there will not be admitted to the radiotelegraphic service any special service with the exception of the radiotelegrams for the press.

Sixth. There will be no franks recognized in connection with the radiotelegraphic service except on messages sent by His Excellency the President of the Republic and official messages sent by the Secretary of State, the superior officers of the Republic, commanders of Chilean ships of war, and the Director General of Telegraphs.

All funds received by the offices of the State Telegraphs in payment for radiotelegrams will be paid into the respective fiscal treasuries for the account of the State Telegraph combined service, and these fiscal treasuries will credit these funds to the respective

department accounts maintained by the fiscal treasurer in Santiago. There will be credited to the same account by the Director General of Telegraphs, the balances received from other countries and other administrations for the value of radiotelegrams. The payment of the balances due other countries or administrations for the account of radiotelegrams will be made from this same fund, which may be drawn upon for this purpose by the Director General of Telegraphs.

Eighth. For the present, and until other instructions are issued, the international regulations appended to the radiotelegraphic convention, which was subscribed to in London in July, 1912, will be followed.

COMMERCIAL EXTRA FIRST-GRADE LICENSES FOR OPERATORS ON UNITED FRUIT CO. SHIPS.

Under date of January 26, 1916, the Tropical Radio Telegraph Co. issued the following circular pointing out to operators on United Fruit Co. ships the desirability of securing commercial extra first-grade licenses:

TO ALL OPERATORS:

Ship operators are again reminded that it is highly desirable to hold the extra first-grade commercial operators' licenses issued by the Department of Commerce. The possession of such a license is a distinct mark of ability, and in considering men for promotion to positions as chief operators on board ship, as well as trick operators at shore stations, those holding an extra grade license will be given preference regardless of their length of service.

In general, it should be the aim of every radio operator on board a United Fruit Co. ship to hold an extra grade license.

Operators who obtain an extra grade license should notify the general office promptly, giving the license number and date issued.

Yours very truly,

GEO. S. DAVIS,
General Superintendent.

The commercial extra first-grade license is the highest class of license, and is issued by the Department of Commerce to radio operators who pass a special examination demonstrating unusual experience and skill. These licenses are given consideration by the Civil Service Commission in examinations for positions requiring knowledge of radiotelegraphy when experience is rated as a part of such examinations. To be eligible for the examination for the commercial extra first-grade license applicants must hold commercial first-grade licenses, and their certificates of skill in radio communication, issued under the act of June 24, 1910, or licenses under the act of August 13, 1912, must record 18 months' satisfactory commercial service at sea or at land stations, either or both, during the two years previous to the filing of the application for examination, as shown by indorsement on the license service records, or other satisfactory evidence, and provided that the applicants have not been penalized for a violation of the radio laws and regulations.

A speed of at least 30 words per minute, Continental Morse, and 25 words per minute, American Morse (five letters to the word), must be attained. The technical questions and the questions of the radio laws and regulations will be considerably wider in scope than those for commercial first grade, and a higher percentage will be required.

All examination papers, including the code test sheets, are marked and forwarded to the Commissioner of Navigation with a recommendation by the radio inspector or examining officer. Examination papers are marked upon the basis of 100, and licenses are recommended only if 80 or better is attained.

Licenses of this grade are issued by the Commissioner of Navigation, indorsed by the Secretary of Commerce, and delivered to the successful applicant through the examining officer.

UTILIZATION OF WIRELESS FOR TRANSMISSION OF WEATHER OBSERVATIONS.

At the request of the Weather Bureau arrangements have been made by the United States Bureau of Lighthouses for taking weather observations on the light vessels at Nantucket Shoals, Mass.; Diamond Shoals, N. C.; Fryng Pan Shoals, N. C.; and Heald Bank, Tex. These light vessels are all equipped with radio, by means of which observations may be transmitted to any point desired.

LOS ANGELES AMATEURS FINED FOR RADIO VIOLATIONS.

On March 23, 1916, four amateurs, all residents of Los Angeles, Cal., appeared before Judge Oscar A. Trippet, of the United States District Court, and entered pleas of guilty to Federal indictments returned last December, charging them with operating radio stations without first having obtained licenses from the Government. Fines were imposed by Judge Trippet and the offenders were admonished to be more cautious in future.

The trial of two other amateurs, who pleaded not guilty, has been set for next July.

The maximum penalty for the above violation is a fine of \$100 and imprisonment for a period of two months.

BOSTON AMATEUR PENALIZED.

On April 19, 1916, the radio inspector at Boston, Mass., reported an amateur in his district for violation of sections 1, 3, and 7 of the act of August 13, 1912. The case was referred to the United States district attorney for prosecution. A verdict of guilty was rendered in the district court and a fine imposed.

The maximum penalty for the above violation is a fine of \$500 and confiscation of the apparatus unlawfully used.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, June, 1916—No. 18

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WASHINGTON, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Range.	Wave length.	Service.	Hours.	Station controlled by—
Conneaut Harbor, Ohio. ¹	WEV	200	300, 475, 540, 600	PR	X	Marquette & Bessemer Dock & Navigation Co.
Davenport, Iowa ²	WPT	300	500	(?)	X	Western Flour Mill Co. (International Milling Co.).
New Prague, Minn. ³ ..	WPU	300	500	(?)	X	New Prague Flouring Mill Co. (International Milling Co.).

¹ G. loc., approximate, O 80° 38' 00", N. 41° 57' 00"; system, Kilbourne & Clark, 240; rates, 3 c. per word 30 c. minimum per radiogram. Note, The station is restricted to communication with the vessels *Marquette & Bessemer No. 1* and *Marquette and Bessemer No. 2*.

² G. loc., approximate, O 80° 33' 10", N. 41° 31' 28"; system, Marconi.

³ Service, limited commercial. Note, The station communicates with stations of the International Milling Co. on business of the company.

⁴ G. loc., approximate, O 93° 31' 12", N. 44° 32' 39"; system, Marconi.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave length.	Owner of vessel.
Bayamon.....	KDX	Marconi.....	300, 600	Vacuum Oil Co.
Henry J. Biddle.....	WOW	Kilbourne & Clark	300, 600	Columbia Contract Co.
Bramell Point.....	KRO	Marconi.....	300, 600	Vacuum Oil Co.
Campana ¹	KOM	Marconi, 1,000.....	300, 450, 600	Standard Oil Co. of New Jersey.
Edgar F. Luckenbach ²	KGK	Kilbourne & Clark, 1,000.	300, 450, 530, 600	Luckenbach Co. (Inc.).
Gov. Forbes ³	WJA	Halcum, variable.	300, 600	Ynchanti Co.
Harry Luckenbach ⁴	KGX	Marconi, 1,000.....	300, 450, 600	Edgar F. Luckenbach.
Hiram B. Everest.....	KRS	Marconi.....	300, 600	Vacuum Oil Co.
Mooremack.....	WCL	do.....	300, 600	Moore & McCormick Co. (Inc.).
Navahoe ⁵	KOR	do.....	300, 600	R. Lawrence Smith (Inc.).
El Capitan (name formerly Oliver J. Olsen). ⁶	WNB	Marconi, 480.....	300, 600	Standard Oil Co. of New Jersey.
Samson.....	WOS	Kilbourne & Clark	300, 600	Columbia Contract Co.
Vigilant ⁷	KPG	Marconi.....	300, 600	Clinchfield Navigation Co.

¹ Range, 200; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

² Range, 250; service, PG; hours, X; rates, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Luckenbach Co. (Inc.), owner of vessel.

³ Range, 200; service, PG; hours, N; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Ynchanti Co., owner of vessel.

⁴ Range, 200; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

⁵ Note, Radio station operated and controlled by Marconi Co.

⁶ Range, 200; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

⁷ Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDX	Bayamon.....b	WCL	Mooremack.....b
KGK	Edgar F. Luckenbach.....b	WEV	Conneaut Harbor, Ohio.....c
KGX	Harry Luckenbach.....b	WJA	Gov. Forbes.....b
KOM	Campana.....b	WNB	El Capitan.....b
KOR	Navahoe.....b	WOS	Samson.....b
KPG	Vigilant.....b	WOW	Henry J. Biddle.....b
KRO	Bramell Point.....b	WPT	Davenport, Iowa.....c
KRS	Hiram B. Everest.....b	WPU	New Prague, Minn.....c

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave length.	Service.	Hours.	Station controlled by—
Cambridge, Mass. (1XU).....	1XU	800, Variable.	P	X	Cutting & Washington (Inc.).
Cleveland, Tenn.	5ZH	425	P	X	W. O. Horner.
Denver, Colo. (9ZF).....	9ZF	425, 550, 800	P	X	Company A, Signal Corps, National Guard of Colo- rado.
Elmira, N. Y.	8ZE	200, 425	P	X	Harry E. Fitch.
Ithaca, N. Y. (8XT).....	8XT	Variable.	P	X	Cornell University.
Oil City, Pa.	8YW	200, 450	P	X	Clarence M. Wickes.
Pittsburgh, Pa. (8YZ).....	8YZ	200, 450	P	X	Charles C. Dunning (Pea- body High School).
Shreveport, La.	5ZS	800, 425	P	X	Willie E. Antony.
Springfield, Mass.	1ZS	200, 300, 425, 600.	P	X	George U. Readio.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XU	First district:	8XT	Eighth district:
1ZS	Cambridge, Mass. (1XU).	8YW	Ithaca, N. Y. (8XT).
5ZH	Springfield, Mass.	8YZ	Oil City, Pa.
5ZS	Fifth district:	8ZE	Pittsburgh, Pa. (8YZ).
	Cleveland, Tenn.	9ZF	Elmira, N. Y.
	Shreveport, La.		Ninth district: Denver, Colo. (9ZF).

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=limited public.

P=private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

AKUTAN, ALEUTIAN ISLANDS, ALASKA.—Range, 50; system, composite, 500; W. L., 300, 525, 600; service, limited commercial. Note, The station is restricted to correspondence of a private nature with the United States naval station at Dutch Harbor, Alaska.

ANCHORAGE, ALASKA.—G. loc., approximate, O 149° 50' 00'', N. 61° 16' 00''; range, 150; system, Kilbourne & Clark, 1,000; W. L., 300, 600, 750, 1,000; service, O; hours, X.

ASTORIA, OREG.—G. loc., approximate, O 123° 51' 00'', N. 46° 11' 00''; range, 300; W. L., 300, 600. Strike out the following note: The long wave lengths are used for limited public service with Ketchikan, Alaska; rates, for commercial business, \$1.25 for 10 words (10 word minimum) and 12 c. for each additional word, domestic count. For press despatches, 3 c. per word.

BROOKLYN, N. Y.—Range, 500; system, Fessenden, 1,000; W. L., 300, 550, 600, 1,650, 2,000; hours, 4m-8m; 5s-9s, time of the meridian 75° west of Greenwich. Note, Radio station operated and controlled by National Electric Signaling Co.

FORT MILLS, CORREGIDOR ISLAND, MANILA BAY, P. I.—G. loc., E 120° 34' 40''. N. 14° 22' 52''; Range, 35; system, U. S. Army, 1,000; W. L., 600, 825. Note, Radio station operated and controlled by United States War Department.

HILLCREST, DALY CITY, CAL.—System, Marconi, 520.

JUALIN, ALASKA.—W. L., 300, 500, 600, 1,980; service, PG; hours, 8.30m-8.45m; 1.30s-1.45s; 7.30s-7.45s; rates, PG service with ships, 6 c. per word 60 c. minimum per radiogram. Note, The station also conducts private correspondence with the Marconi station at Juneau, Alaska.

KAUNAKAKAI, ISLAND OF MOLOKAI, T. H.¹—Range, 30; W. L., 300, 450, 600; hours, 7m-12m; 1s-5:30s. Note, The station is restricted to communication with Lahaina.

KAWAIHAE, ISLAND OF HAWAII, T. H.¹—W. L., 300, 575, 600; service, limited commercial; hours, 7m-12m; 1s-5:30s. Note, The station is restricted to communication with Wahiawa, Lahaina, and Lihue.

LAHAINA, ISLAND OF MAUI, T. H.¹—W. L., 300, 575, 600; service, limited commercial; hours, 7m-12m; 1s-5:30s. Note, The station is restricted to communication with Wahiawa, Kawaihae, Kaunakakai, and Lihue.

LIHUE, ISLAND OF KAUAI, T. H.¹—System, Marconi, 565; W. L., 300, 575, 600; service, limited commercial; hours, 7m-12m; 1s-5:30s. Note, The station is restricted to communication with Wahiawa, Kawaihae, and Lahaina.

¹ Rates for interisland messages: Ordinary messages, per word, 15 c.; minimum charge, \$1.50; address and signature counted; press messages, per word, 7½ c.; minimum charge, \$1; address and signature counted; cipher or code messages, origin and destination Hawaiian Islands, per word 50 c.; minimum charge, \$1.50; address and signature counted. Cablegrams or trans-Pacific wireless messages in cipher, code, foreign, or English will be accepted and forwarded at ordinary rates plus the forwarding charges of the cable or wireless company, when such messages are to be delivered to them for forwarding; no minimum charge to apply. Double-rush messages will be charged for at double rate. Messages filed in other than English will be charged for at the code rate. A night letter of 25 words, including address and signature, from any point in the Hawaiian Islands to any other point in the Hawaiian Islands, \$1.50; each additional word above twenty-five, 5 c.

- NAKNEK, ALASKA (KMK).**—System, Composite, 400; W. L., 300, 500, 600; service, limited commercial. Note, The station is limited to correspondence with stations of the Red Salmon Canning Co., and the U. S. naval stations at St. George and St. Paul (Pribilof Islands) and Kodiak, Alaska.
- PORT ARTHUR, TEX.**—Hours, 6: 30m–12m; 12: 30s–6s; 6: 30s–8: 30s.
- ROCHE HARBOR, WASH.**—W. L., 300, 600, 1,800.
- SAYVILLE, L. I.**—G. loc., 73° 08' 12", N. 40° 14' 46"; range, 4,500; W. L., 3,900, 4,700, 5,200, 6,300, 7,800, 9,400; rates, transoceanic service, 25 c. per word. Notes, Radio station temporarily operated and controlled by United States Naval Radio Service, Radio, Va.; accounts handled by Atlantic Communication Co., 47 West Street, New York, N. Y. The station communicates with Nauen, Germany.
- TUCKERTON, N. J.**—Range, 4,000; system, Goldschmidt and arc; W. L., 8,600; service, PR; hours, N; rates, transoceanic service, 25 c. per word. Notes, Radio station temporarily operated and controlled by United States Naval Radio Service, Radio, Va. The station communicates with Ellvise, Germany.
- UGASHIK, ALASKA.**—W. L., 300, 500, 600; service, limited commercial. Note, The station is limited to correspondence with station of the Naknek Packing Co., Naknek, Alaska (KMK).
- WAHIAWA, ISLAND OF OAHU, T. H.¹**—O. 158° 02' 37", N. 21° 29' 28"; W. L., 300, 575, 600; service, PG; hours, PG service continuous; special interisland service, 7m–12m; 1s–5: 50s. Note, The station also conducts special service, communicating with Kawaihae, Lahaina, and Lihue (Hawaii). Apia (Samoa), and Papeete (Tahiti).

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1913, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- ACUSHNET.**—W. L., 300, 600.
- ADELINE SMITH.**—Range, 150; system, Marconi, 480.
- ALOHA.**—Note, Radio station operated and controlled by Arthur Curtiss James, owner of vessel.
- AMAZONIA.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
- AROLINE.**—System, Marconi, 480.
- ATLAS (WTT).**—System, Marconi, 1,000; W. L., 300, 450, 600. Note, Standard Oil Co. of California, owner of vessel.
- BAY STATE.**—Range, 200; system, Marconi, 480.
- BEAR (WWD).**—Range, 150.
- BERLIN.**—System, Marconi, 400.
- BOSTON.**—System, Fessenden, 260; W. L., 300, 550, 600.
- BRADFORD.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- BREAKWATER.**—Range, 150; system, Marconi, 400; hours, N. Note, Southern Pacific Co., owner of vessel.
- C. A. CANFIELD.**—Range, 100; system, Marconi, 300; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

¹ Rates for interisland messages: Ordinary messages, per word, 15 c.; minimum charge, \$1.50; address and signature counted; press messages, per word, 7½ c.; minimum charge, \$1; address and signature counted; cipher or code messages, origin and destination Hawaiian Islands, per word 50 c.; minimum charge, \$1.50; address and signature counted. Cablegrams or trans-Pacific wireless messages in cipher, code, foreign, or English will be accepted and forwarded at ordinary rates plus the forwarding charges of the cable or wireless company, when such messages are to be delivered to them for forwarding; no minimum charge to apply. Double-rush messages will be charged for at double rate. Messages filed in other than English will be charged for at a code rate. A night letter of 25 words, including address and signature, from any point in the Hawaiian Islands to any other point in the Hawaiian Islands, \$1.50; each additional word above twenty-five, 5 c.

² Rate to Apia and Papeete, 50 c. per word; no minimum.

- CADDO.**—System, Marconi, 1,000; W. L., 300, 450, 600; hours, X. Note, Radio station operated and controlled by Marconi Co.
- CAPTAIN A. F. LUCAS.**—Range, 150; system, Marconi; W. L., 300, 450, 600.
- CAPTAIN A. M. WETHERILL.**—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- CAPTAIN BARRETT.**—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- CAPTAIN CHAS. W. ROWELL.**—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- CAPTAIN JAMES FORNANCE.**—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- CELILO.**—Range, 150.
- CITY OF ROCKLAND.**—System, Marconi, 400.
- CITY OF SOUTH HAVEN.**—System, Marconi, 480.
- COALINGA.**—Range, 150; system, Federal-Poulsen arc, 250; W. L., 300, 600, 1,800.
- COL. E. L. DRAKE.**—System, Marconi, 1,000; W. L., 300, 450, 600.
- CROOK.**—Range, 200 during day, 900 at night; system, United States Army, 1,000; W. L., 300, 600. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- CUBACAO.**—Range, 150; system, Marconi, 400; service, PG; hours, N.
- DADE.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- DAWNLITE.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- DAYLITE.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- DE SOTO.**—Range, 150; system, Marconi, 1,000; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EOCENE.**—System, Telefunken, 1,000; W. L., 300, 600; service, PG; hours, 9m–12m; 2s–5s; 8s–10:30s; rates 4 c. per word 40 c. minimum per radiogram. Note, Standard Transportation Co., owner of vessel.
- FLORENCE LUCKENBACH.**—Note, Luckenbach Co., Inc., owner of vessel.
- FRED'K LUCKENBACH.**—Range, 200; system, Marconi, 240; service, PG; hours, X.
- GENERAL A. M. RANDOL.**—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL E. O. C. ORD.**—Range, 100; system, United States Army, 1,000; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL HARVEY BROWN.**—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL HENRY J. HUNT.**—Range, 100; system, United States Army, 1,000; W. L., 600; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL HENRY KNOX.**—Range, 100; system, United States Army, 1,000; W. L., 600; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL R. B. AYRES.**—Range, 100; system, United States Army, 1,000; W. L., 600; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.

- GENERAL ROBERT ANDERSON.**—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL ROYAL T. FRANK.**—Range, 100; system, United States Army, 1,000; W. L., 600; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL S. N. MILLS.**—System, United States Army, 1,000; W. L., 600; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GEORGIANA.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service 4 c. per word 40 c. minimum per radiogram; transoceanic service 8 c. per word 80 c. minimum per radiogram.
- GLOUCESTER (KQG).**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- HAMILTON.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- HATTIE LUCKENBACH.**—Note, Luckenbach Co., Inc., owner of vessel.
- INCO No. 1.**—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
- J. A. CHANSLOB.**—System, Federal-Poulsen arc, 300; W. L., 300, 600, 1,800. Note, Radio station operated and controlled by Federal Telegraph Co.
- J. A. MOFFETT.**—W. L., 300, 600, 1,800.
- JEFFERSON (KOD).**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- J. L. LUCKENBACH.**—Note, Luckenbach Co. (Inc.), owner of vessel.
- KENTRA.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80c. minimum per radiogram.
- KOREA.**—System, Marconi, 480.
- KVICHAK.**—W. L., 300, 400, 500, 600.
- LAKELAND.**—System, Marconi, 480.
- LAKEPORT.**—Range, 100; system, Marconi, 480; service, PG; hours, X.
- LAKEWOOD.**—Range, 100; system, Marconi, 480; service, PG; hours, X.
- LANSING.**—Range, 150; system, Federal-Poulsen arc, 250; W. L., 300, 600, 1,800; hours, X. Note, Radio station operated and controlled by Federal Telegraph Co.
- LEWIS LUCKENBACH.**—Note, Luckenbach Co. (Inc.), owner of vessel.
- L. ROSCOE.**—Range, 150; system, Kilbourne & Clark, 1,000; W. L., 300, 600, 750; service, O; hours, X. Note, Alaska Engineering Commission, owner of vessel.
- MATINICOCK.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
- MEXICANO.**—System, Marconi, 400; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MOONLITE.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- MORRILL.**—W. L., 300, 600.
- MUNPLACE.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
- NEBRASKAN.**—Name changed to *Rockingham*.
- NUSHAGAK.**—W. L., 300, 400, 500, 600.
- OLEUM.**—System, Federal-Poulsen arc, 250.
- PAMLICO.**—W. L., 300, 600.
- PAN-AMERICAN.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PAVLOF.**—Strike out all particulars.
- PETROLITE.**—W. L., 300, 450, 600; hours, X.
- POLARINE.**—W. L., 300, 450, 600; hours, X.

- REPUBLIC.**—Range, 150; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- RICHARD.**—Strike out all particulars.
- ROANOKE.**—Strike out all particulars.
- ROCKINGHAM.**—(Name formerly *Nebraskan*); system, Marconi, 1,000; W. L., 300, 450, 600. Note, Radio station operated and controlled by Marconi Co.; Garland Steamship Corporation, owner of vessel.
- ST. HELENS.**—Strike out all particulars.
- SAN JOSE.**—System, Marconi, 480.
- SANTA CLARA (WBA).**—System, Marconi, 480; hours, X.
- SATSUMA.**—Note, Barber & Co. (Inc.), owner of vessel.
- SIBERIA.**—Note, International Mercantile Marine Co., owner of vessel.
- SNOHOMISH.**—W. L., 300, 600.
- SOMERSET (KQS).**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- STARLITE.**—Service, PG; rates, North and South American service 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- SUNLITE.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- TAMESI.**—Range, 200; system, Marconi, 480; service, PG; hours, X.
- THE LIMIT.**—Range, 100; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, 2 c. per word 20 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- TWILITE.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- VANADIS.**—W. L., 300, 600.
- VENETIA.**—Range, 100; system, Marconi, 1,000; W. L., 300, 600; service, P; hours, X.
- VIRGINIA (WFH).**—System, Marconi, 480.
- VIRGINIA (WKV).**—Hours, X.
- WALLULA.**—System, Marconi, 120.
- WASHTENAW.**—Strike out all particulars.
- WHITTIER.**—Range, 150; system, Federal-Poulsen arc, 250; W. L., 300, 600, 1,800; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co.
- WM. F. HERRIN.**—Range, 150; system, Federal-Poulsen arc, 300; W. L., 300, 600, 1,800. Note, Radio station operated and controlled by Federal Telegraph Co.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all the particulars following the call signals: WLG, WNO, WNY, WRR, WTH.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1915, only.]

- FAYETTEVILLE, ARK.**—Call, 5YM.
- IOWA CITY, IOWA.**—500, variable under 600 and over 1,600.
- LINCOLN, NEBR.**—Strike out all the particulars.
- ST. LOUIS, MO. (9YR).**—Change to St. Louis, Mo. (9XY).

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all the particulars following the call signal: 9XT.

MISCELLANEOUS.

TRANSMISSION OF WEATHER REPORTS BY NAVAL RADIO STATIONS.

Through cooperation with local offices of the United States Weather Bureau, weather forecasts are sent broadcast to sea through naval coast radio stations at certain times, varying with the locality. Coast stations are generally prepared to give local forecasts to passing vessels without charge, on request. Storm warnings are sent whenever received and the daily weather bulletins are distributed by the naval radio stations at Arlington, Va., and Key West, Fla., a few minutes after the 10 p. m. time signal. These bulletins consist of two parts.

The first part contains code letters and figures which express the actual weather conditions at 8 p. m., seventy-fifth meridian time, on the day of distribution, at certain points along the eastern coast of North America, one point along the Gulf of Mexico, and one at Bermuda.

The second part of the bulletin contains a special forecast of the probable winds to be experienced a hundred miles or so off shore, made by the United States Weather Bureau, for distribution to shipmasters. The second part of the bulletin also contains warnings of severe storms along the coasts, as occasions for such warnings may arise.

Immediately following this bulletin, a weather bulletin for certain points along the Great Lakes is sent broadcast by the naval radio station at Arlington, Va., consisting of two parts. The first part contains code letters and figures which express the actual weather conditions at 8 p. m., seventy-fifth meridian time, on the day of distribution, at certain points along the Lakes. The second part of the bulletin contains a special forecast of the probable winds to be experienced on the Lakes during the season of navigation—about April 15 to December 10.

The points for which weather reports are furnished are designated as follows: *For Atlantic coast and Gulf points*, S=Sydney, T=Nantucket, DB=Delaware Breakwater, H=Hatteras, C=Charleston, K=Key West, P=Pensacola, and B=Bermuda; *for points on the Great Lakes*, Du=Duluth, M=Marquette, U=Sault Ste. Marie, G=Green Bay, Ch=Chicago, L=Alpena, D=Detroit, V=Cleveland, and F=Buffalo.

All bulletins begin with the letters U. S. W. B. (United States Weather Bureau) and the weather conditions follow. The first three figures of a report represent the barometric pressure in inches (002=30.02); the next figure, the fourth in sequence, represents the direction of the wind to the eight points of the compass: 1=north, 2=northeast, 3=east, 4=southeast, 5=south, 6=southwest, 7=west, 8=northwest, and 0=calm. The fifth figure represents the force of the wind on the Beaufort scale, on page following.

BEAUFORT SCALE OF WIND FORCE.

Number and designation.	Statute miles per hour.	Nautical miles per hour.
0 Calm.....	0 to 3	0 to 2.6
1 Light air.....	8	6.9
2 Light breeze.....	13	11.3
3 Gentle breeze.....	18	15.6
4 Moderate breeze.....	23	20.0
5 Fresh breeze.....	28	24.3
6 Strong breeze.....	34	29.5
7 Moderate gale.....	40	34.7
8 Fresh gale.....	48	41.6
9 Strong gale.....	56	48.6
10 Whole gale.....	65	56.4
11 Storm.....	75	65.1
12 Hurricane.....	90 and over.	78.1 and over.

In order to simplify the code, no provision has been made for wind force greater than 9, strong gale, on the Beaufort Scale. Whenever winds of force greater than 9 occur, the number representing them is given in words instead of figures, thus: Ten, eleven, etc.

EXAMPLES OF CODE.

U S W B S 96465 T 91674 DB 94686 H 99886 C 01214
K 02622 P 03613 B 00065.

Translation.

United States Weather Bureau.

Station.	Pressure.	Wind.	
		Direction.	Force. ¹
Sydney.....	29.64	SW	5
Nantucket.....	29.16	W	4
Delaware Breakwater.....	29.46	NW	6
Hatteras.....	29.98	NW	6
Charleston.....	30.12	N	4
Key West.....	30.26	NE	2
Pensacola.....	30.36	N	3
Bermuda.....	30.00	SW	5

¹ See Beaufort Scale.

U S W B Du 95826 M 97635 U 00443 G 96046 Ch 95667
L 00644 D 00842 V 01054 F 01656

Translation.

United States Weather Bureau.

Station.	Pressure.	Wind.	
		Direction.	Force. ¹
Duluth.....	29.58	NE	6
Marquette.....	29.76	E	6
Sault Ste. Marie.....	30.04	SE	3
Green Bay.....	29.60	SE	6
Chicago.....	29.56	SW	7
Alpena.....	30.06	SE	4
Detroit.....	30.08	SE	2
Cleveland.....	30.10	S	4
Buffalo.....	30.16	S	6

¹ See Beaufort Scale.

TRANSMISSION OF TIME SIGNALS BY NAVAL RADIO STATIONS.

The transmission of time signals to vessels at sea by means of radiotelegraphy was first accomplished in the United States in 1905, and this service, enlarged and extended, has continued to the present time. This service is of the greatest value to mariners, as it furnishes a means by which the time, as given by the transmitted signals, may be compared with a ship's chronometer and the error of the chronometer found. Similar comparisons over a number of days enable data to be obtained by which not only the error may be found, but also the chronometer rate; that is, the rate at which it is gaining or losing.

The noontime signals on the Atlantic coast are sent out through the coast radio stations by connection with Western Union telegraph lines from the United States Naval Observatory at Washington, D. C. By the operation of proper relays in electrical circuits, the beats of the seconds of a standard clock in the observatory are sent out broadcast as a series of radio dots, commencing five minutes before the time of the final signal. By omitting certain dots in a series, the comparison between the dots and the beats of the chronometer seconds can be checked until the instant of local noon (seventy-fifth meridian time) is reached. This is marked by a longer dot, which gives the time of exact noon. A comparison with the chronometer time at that instant gives its error referred to the seventy-fifth meridian time. Applying the difference in longitude, namely, five hours, between the seventy-fifth meridian and Greenwich, which is the standard meridian (or 0° longitude), the error of the chronometer referred to Greenwich time is determined.

Time signals are now sent out on the Atlantic coast only through the radio stations at Arlington, Key West, and New Orleans. Signals from Arlington, which reach a zone formerly served by other coast stations, are sent out every day in the year twice a day, viz, at noon and 10 p. m., seventy-fifth meridian time. Time signals from Key West and New Orleans are sent out daily, including Sundays and holidays, commencing at 11.55 a. m., seventy-fifth meridian time, and ending at local noon.

In case of failure of the Arlington high-power station, the signals are sent out by the small set in the same station, and the stations at Boston, Newport, Norfolk, and Charleston are notified, and they each send the signals broadcast.

On the Pacific coast the time signals are sent broadcast to sea through the naval radio stations at Mare Island, Eureka, Point Arguello, and San Diego, Cal., and at North Head, Wash. The controlling clock for each station is in the naval observatory at the Mare Island Navy Yard. Signals from Mare Island are sent out every day from 11.55 to noon, and from 9.55 to 10 p. m., one hundred and twentieth meridian standard time. Those from North Head, Eureka, and San Diego are sent out daily, excluding Sundays and holidays, from 11.55 to noon, one hundred and twentieth meridian standard time.

To get the maximum clearness of signals, the receiving circuit should be tuned to that of the sending station. Arlington and Mare Island send on a 2,500-meter wave length, North Head and San Diego on a 2,000-meter wave length, Eureka on a 1,400-meter wave

length, and Key West and New Orleans on a 1,000-meter wave length. On the completion of the new radio station at the training station, Great Lakes, time signals will be transmitted from that station for the benefit of shipping on the Great Lakes, as well as the weather reports for that region, now transmitted by Arlington after the Atlantic coast weather bulletin, following the 10 p. m. time signals.

CHILEAN WIRELESS SERVICE.

The Bureau has been informed by the Chilean Administration, through the Bureau of the International Telegraphic Union, Radiotelegraphic Service, Berne, Switzerland, of the opening to public service early in April of the radiotelegraphic stations Valparaiso, Llanquihue, Frutillar, and Punta Arenas.

NOTICE TO AMATEURS.

The new list of "Radio Stations of the United States," edition of July 1, 1916, will contain the names, addresses, and call letters of all licensed amateurs of record in the Bureau on June 30, 1916, and where applications for station licenses are received after June 30, the names will not be published until the 1917 list is issued.

All amateurs who desire to have their names listed in the 1916 book should make an effort to have their licenses renewed without delay.

AN AMENDMENT TO RADIO REGULATIONS.

[To be cut out and pasted in your copy.]

Insert the following regulation which is made pursuant to the act of August 13, 1912, following paragraph 152, page 66, of the Radio Laws and Regulations of the United States:

Paragraph 152-a, page 66.

Holders of commercial extra first-grade radio operators' licenses may be issued renewal of such licenses without examination, provided the service records on the backs of the licenses properly certify to 12 months' satisfactory service in a land or ship station open to general public service, at least 6 months of which must have been served during the last 12 months of the license period.

However, holders of commercial extra first-grade licenses now employed as radio inspectors, radio instructors, or similar occupations requiring exceptional qualifications where the duties require the testing, or demonstrating, or otherwise using commercial radio apparatus and the telegraph codes; may be issued renewals of their licenses without reexamination, provided, in addition to the above, they can show satisfactory evidence of such service covering a period of 18 months out of the two-year license period. Where the applicant has not used regularly the telegraph codes, he will be given the code examination required in the original examination or, if he has used only one code, he will be examined in the code not used.

The service record shown on the licenses must be transcribed on Form 756.

The license may be marked "Expired" in red across the face and returned to the operator, if desired. The action taken should be noted on Form 756.

Where the record on the reverse side of the license does not show the service performed, the evidence submitted as proof of such service must be transmitted to the Bureau with Form 756.

Transcriptions of code tests must be submitted to the Bureau.

PORTUGUESE CENSORSHIP.

The Bureau has been informed through the International Telegraphic Bureau at Berne that beginning May 1 the Portuguese colonies will admit for transmission by their lines only private telegrams and radiograms which are worded in clear Portuguese, French, or English, and containing the signature of the sender. However, the use of divers codes established by special arrangement is maintained for commercial telegrams. The telegrams are accepted only at the risk and peril of the sender, and they are submitted to censorship, which may entail delay, and no request for reimbursement will be considered.

The use of the Italian language is admitted in correspondence between the Portuguese colonies and Italy, Lybia, and the Italian possessions in oriental Africa.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, July 1, 1916—No. 19

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WASHINGTON, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.

50073—16



NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	System.	Range.	Wave lengths.
Cape St. Elias, Alaska ¹	O 144 36 18 N 59 47 48	NLQ	United States Bureau of Lighthouses, 1000.	100	600, 800, 1000, 1200.
Providence, R. I. ²	O 71 25 00 N 41 49 00	WPF	Chaffee arc.....	100	300, 425, 600

¹ Service, PG; rates, 6 c. per word 60 c. minimum per radiogram (ship communication, cable count; shore communication, domestic count). Note, Radio station operated and controlled by United States Bureau of Lighthouses, Washington, D. C.

² Service, P; hours, X. Note, Radio station operated and controlled by Dutee W. Flint. The station communicates only with the owner's yacht.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Aztec (KZC).....	KZC	Marconi.....		A. C. Burrage.
Bacoi ¹	KJU	Marconi, 1000.....	300, 450, 600	Standard Oil Co. of New Jersey.
Clincher.....	KMC	Marconi.....	300, 600	Clinchfield Navigation Co.
George E. Paddleford ²	WIV	do.....	300, 450, 600	Petroleum Transport Co.
Gettysburg.....	WCK	do.....	300, 600	Moore & McCormick Co.
Halcyon ³	KZL	Chaffee arc.....	300, 425, 600	Duttee W. Flint (yacht).
J. M. Danziger ²	WIW	Marconi.....	300, 450, 600	Petroleum Transport Co.
Josephine.....	KZU	do.....		Joseph Widener.
Norwood ⁴	WSG	Kilbourne & Clark, 500.....	300, 450, 525, 600.	Pacific-American Fisheries Co.
Westoll.....	KJT	Marconi.....	300, 600	Standard Oil Co. of New Jersey.

¹ Range, 150; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

² Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

³ Service, P; hours, X. Note, Radio station operated and controlled by owner of vessel.

⁴ Range, 250; service PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radiogram station operated and controlled by owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KJT	Westoll.....	NLQ	Cape St. Elias, Alaska.....
KJU	Bacoi.....	WCK	Gettysburg.....
KMC	Clincher.....	WIV	George E. Paddleford.....
KZC	Aztec.....	WIW	J. M. Danziger.....
KZL	Halcyon.....	WPF	Providence, R. I.....
KZU	Josephine.....	WSG	Norwood.....

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave length.	Service.	Hours.	Station controlled by—
Bakersfield, Ohio.....	6ZW	200, 425.....	P	X	Lindley Winsor.
Beverly Farms, Mass.....	1ZH	200, 300, 425, 600.	P	X	Wilbur H. Hardy.
Eldora, Iowa.....	9ZI	200, 425.....	P	X	Donald R. Lewis.
Lewiston, Mont.....	7ZC	200, 425.....	P	X	Arthur C. Campbell.
Marlboro, Mass.....	1XS	300, 600, variable.	P	X	Louis Waldo Stevens.
Morgantown, W. Va.....	8XG	650.....	P	X	C. W. Waggoner (West Virginia University).
New Rochelle, N. Y.....	2ZK	280, 435.....	P	X	George C. Cannon.
New York, N. Y.....	2ZA	300, 450, 600.....	P	X	New York police department.
Pierre, S. Dak.....	9ZP	200, 425.....	P	X	Dana McNeil.
Pittsburgh, Pa.....	8XC	1800, 2100, 3000.....	P	X	Carnegie Institute of Technology.
Seattle, Wash.....	7XE	300, 600, variable.	P	X	Marconi Co.
Stillwater, Minn.....	9YM	200, 300, 425.....	P	X	Fred B. Wood, Company K, Third Infantry, Minnesota National Guard.
Vancouver, Wash.....	7ZN	200, 300, 425, 600.	P	X	George H. Wallace.
Washington, D. C.....	3ZW	200, 425.....	P	X	Walther A. Parks.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XS	First district:		Seventh district—Continued.
1ZH	Marlboro, Mass.	7ZC	Lewiston, Mont.
	Beverly, Mass.	7ZN	Vancouver, Wash.
2ZA	Second district:	8XC	Eighth district:
2ZK	New York, N. Y.	8XG	Pittsburgh, Pa.
3ZW	New Rochelle, N. Y.		Morgantown, W. Va.
6ZW	Third district: Washington, D. C.	9YM	Ninth district:
	Sixth district: Bakersfield, Cal.	9ZI	Stillwater, Minn.
7XE	Seventh district:	9ZP	Eldora, Iowa.
	Seattle, Wash.		Pierre, S. Dak.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name = Name of station.

G. loc. = Geographical location: O = west longitude, N = north latitude.

Call = Call letters assigned.

System = Radio system used and sparks per second.

Range = Normal range in nautical miles.

W. L. = Wave lengths assigned: Normal wave lengths in italics.

Service = Nature of service maintained:

PG = General public.

PR = Limited public.

P = private.

O = Government business exclusively.

Hours = Hours of operation:

N = Continuous service.

X = No regular hours.

m = a. m. (12m = midday).

s = p. m. (12s = midnight).

Rates = Ship or coast charges, in cents: c = cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes = Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co. = Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- BOLINAS, CAL.**—Range, 3,500; system, Marconi, 420; W. L., 6,100; service, limited commercial; hours, N.; rates, cable count, 25 c. per word. Lettergrams \$1 for first 12 words, each additional word 8 c. Week-end letters, \$1.50 for first 24 words, each additional word 6 c. Note, Radio station operated and controlled by Marconi Co. The station communicates only with Koko Head, T. H.
- EGEAK, ALASKA.**—W. L., 300, 500, 600; service, limited commercial. Note, Station limited to correspondence with ship and land stations of North Alaska Salmon Co.
- FORT SHAFTER, HONOLULU, T. H.**—Strike out all particulars.
- HEEIA POINT, ISLAND OF OAHU, T. H.**—W. L., 300, 600, 1,800, 3,000, 8,000, 9,300, 10,600; service PG and limited commercial; hours, 7.30m–11.30e. Note.—Radio station operated and controlled by Federal Telegraph Co. The station also communicates with South San Francisco, Cal., and Portland, Oreg.; rates, cable count, 25 c. per word to South San Francisco and 29 c. per word to Portland.
- HOLLISTER, CAL.**—System, Composite, 240; service, limited commercial. Note, Radio station operated and controlled by Palmer B. Hewlett. Station restricted to communicate with Oakland, Cal. (KGI).
- HULL, MASS.**—Strike out all particulars.
- INGLEWOOD, CAL.**—G. loc., O 118° 19' 48'', N. 33° 58' 04''; range, 500; W. L., 300, 600, 3,300, 4,000; service, limited commercial; hours, 9m–6s. Note, Radio station operated and controlled by Federal Telegraph Co. Station communicates only with San Francisco, Cal., San Diego, Cal., and Phoenix, Ariz.; rates, for 15 words to San Diego, 25 c.; to San Francisco, 40 c.; to Phoenix, 50 c.¹
- JACKSONVILLE, FLA.**—W. L., 300, 450, 600; hours, 6m–8m, 10m–1s, 4s–7s.
- KOGIUNG, ALASKA (KVV).**—G. loc., O 156° 55' 30'', N. 58° 52' 30''; range, 250; system, KILBOURNE & CLARK, 1,000; service, PG; hours, 6.30s–9.30s; rates, 6 c. per word, 60 c. minimum per radiogram.
- KOKO HEAD, ISLAND OF OAHU, T. H.**—Range, 2,200; system, Marconi, 420; W. L., 6,200; hours, N. Note, Radio station operated and controlled by Marconi Co. The station communicates only with Bolinas, Cal., and Tahiti, T. H.; rates, cable count, 25 c. per word. Lettergrams, \$1 for the first 12 words; each additional word, 8 c. Week-end letters, \$1.50 for first 24 words, each additional word, 6 c. Tahiti press rate, 20 c. per word.
- LOS ANGELES, CAL. (KLS).**—Range, 1,000; Federal-Poulsen arc; W. L., 300, 600, 1,800, 2,800, 3,250; service, PG; hours, 4m–10s; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram; transoceanic service, 12 c. per word, \$1.20 minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co. The station also communicates with San Francisco, Cal., San Diego, Cal., and Phoenix, Ariz. Rates, for 15 words to San Diego, 25 c.; to San Francisco, 40 c.; to Phoenix, 50 c.¹
- MIAMI, FLA.**—W. L., 300, 450, 600.
- NEWTON, MASS.**—Strike out all particulars.
- NUSHAGAK, ALASKA.**—W. L., 300, 500, 600; service, limited commercial. Note, Station limited to correspondence with ship and land stations of North Alaska Salmon Co.
- PORT MOLLER, ALASKA.**—Range, 250; hours, 6.30s–9.30s; rates, 6 c. per word, 60 c. minimum per radiogram.
- SAN FRANCISCO, CAL. (KFS).**—System, Federal-Poulsen arc; W. L., 300, 600, 1,800, 3,000, 3,500; service, PG; hours, 7m–2m; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram; transoceanic service, 12 c. per word, \$1.20 minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co. The station also communicates with Los Angeles, Cal., San Diego, Cal., and Portland, Oreg.; rates, for 15 words to San Diego, 40 c., to Los Angeles, 40 c., to Portland, 50 c.¹
- SAVANNAH, GA.**—W. L., 300, 450, 600.

¹ See table on p. 5, giving detailed explanation of rates.

SOUTH SAN FRANCISCO, CAL.—System, Federal-Poulsen arc; W. L., 300, 600, 1,800, 5,000, 8,000, 10,000; service, PG; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram; transoceanic service, 12 c. per word, \$1.20 minimum per radiogram. Note, Radio station operated and controlled by the Federal Telegraph Co. The station also communicates with San Diego, Cal., Los Angeles, Cal., Portland, Oreg., and Honolulu, T. H.; rates for 15 words to San Diego, 40 c.; to Los Angeles, 40 c.; to Portland, 50 c.; to Honolulu, 25 c. per word, cable count. Night letters to Honolulu, \$1 for first 12 words, 8 c. for each additional word, cable count. Week-end letters to Honolulu, \$1.50 for first 24 words, 6 c. for each additional word, cable count.¹

SAN DIEGO, CAL. (KSD).—Range, 500; system, Federal-Poulsen arc, 250; W. L., 300, 600, 1,800, 2,800; service, PG; hours, 4m–8s; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram; transoceanic service, 12 c. per word, \$1.20 minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co. The station also communicates with Los Angeles, Cal.; rate, 25 c. for 15 words.¹

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ALAMANCE.—Name formerly *Nevadan*; W. L., 300, 450, 600; hours, X. Note, Radio station operated and controlled by Garland Steamship corporation, owner of vessel.

ALOHA.—W. L., 300, 450, 600; hours, X.

ALVINA.—Range, 300; system, Telefunken, 1,000; W. L., 300, 600; service, P; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Thomas F. Cole, owner of vessel (yacht).

ARDMORE.—Range, 250; system, Marconi, 1,000; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co. Standard Oil Co., of New Jersey, owner of vessel.

ARIZONAN.—Hours, X.

BAYAMON.—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co. Vacuum Oil Co., owner of vessel.

BREAMELL POINT.—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co. Vacuum Oil Co., owner of vessel.

CAPE COD.—Range, 150; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

CORNING.—Range, 300; system, Marconi, 1,000; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

CORSAIR.—Range, 150; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

CUBADIST.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.

CUSHING (KSC).—Range, 300; system, Marconi, 1,000; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

¹ Detailed explanation of rates:

When regular rate of 15 words is—	Additional charge per word is—	Rate for day letter of 35 words in plain English is—	Rate for day letter of 50 words in plain English is—	Rate for night letter of 35 words in plain English is—	Rate for night letter of 50 words in plain English is—
\$0.25	\$0.02	\$0.38	\$0.38	\$0.25	\$0.25
.40	.03	.60	.60	.40	.40
.50	.03	.70	.75	.45	.50

- DAYTON.**—Range, 300; system, Marconi, 1,000; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EL DIA.**—System, Marconi, 1,000; W. L., 300, 450, 600; hours, N; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- ELMER A. KEELER.**—Strike out all particulars.
- EMELINE.**—Strike out all particulars.
- EOCENE.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EXPANSION.**—Range, 20; W. L., 300, 600; service, PG; rates, 4 c. per word 40 c. minimum per radiogram.
- FLORENCE (KYF).**—Strike out all particulars.
- FLORENCE LUCKENBACH.**—System, Marconi, 480; Note, Radio station operated and controlled by Marconi Co. Luckenbach Co. (Inc.), owner of vessel.
- FRANK H. BUCK.**—Range, 150; system, Federal-Poulsen arc; W. L., 300, 600, 1,800. Note, Radio station operated and controlled by Federal Telegraph Co. Associated Oil Co., owner of vessel.
- GALATEA.**—Range, 100; system, Marconi, 240; service, PG; hours, X.
- GLACIER.**—W. L., 300, 600.
- GULFSTREAM.**—System, Marconi, 480; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- HENRY J. BIDDLE.**—Range, 250; system, Kilbourne & Clark, 120; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Columbia Contract Co., owner of vessel.
- HEWITT.**—Hours, 9m-12m, 2s-5s, 7s-9s; strike out rates. (The station conducts general public service, without rates.)
- H. H. ROGERS.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
- HIRAM B. EVEREST.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co. Vacuum Oil Co., owner of vessel.
- MARQUETTE & BESSEMER No. 2.**—System, Kilbourne & Clark, 240; W. L., 300, 425, 540, 600; service, PR. Note, Radio station operated and controlled by Marquette & Bessemer Dock & Navigation Co., owner of vessel. Station is limited to communication with the *Marquette & Bessemer No. 1* and a coast station at Conneaut Harbor, Ohio.
- MATINICOCK.**—System, Telefunken, 1,000; hours, 9m-12m, 2s-5s, 8s-10.30s.
- MUNSONO.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
- MUSKOGEE.**—Range, 300; system, Marconi, 1,000; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- NAVAJO (WNJ).**—Note, Radio station operated and controlled by Marconi Co. Navajo Steamship Co., owner of vessel.
- NEVADAN.**—Name changed to *Alamance*.
- NOMA.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- RAMOS.**—Range, 50; system, Fessenden, 260; service, PG; hours, X.
- REUCE.**—System, Kilbourne & Clark, 240; W. L., 300, 525, 600.
- ROCHESTER.**—Name formerly *Yaguz*.
- SAMSON.**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Columbia Contract Co., owner of vessel.
- SANTA RITA.**—Name formerly *William Chatham*. Note, Radio station operated and controlled by W. R. Grace & Co., owner of vessel.
- SARNIA.**—Note, Radio station operated and controlled by Marconi Co. Bay Steamship Co., of America (Ltd.), owner of vessel.
- SEGURANCA.**—Note, Radio station operated and controlled by Marconi Co. Seguranca Steamship Corporation, owner of vessel.
- SEWARD.**—Rates, 4 c. per word 40 c. minimum per radiogram.
- SIALIA.**—System, Telefunken. Note, Radio station operated and controlled by Atlantic Communication Co. J. K. Stewart, owner of vessel.
- SIBIRIA.**—System, Marconi, 240; hours, N. Note, Radio station operated and controlled by Marconi Co. Bay Steamship Co. of America (Ltd.), owner of vessel.

STANDARD.—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

St. NICHOLAS.—System, Kilbourne & Clark, 240; W. L., 300, 525, 600.

TARANTULA.—Strike out all particulars.

VIGILANCIA.—Hours, X. Note, Radio station operated and controlled by Marconi Co. Gaston, Williams & Wigmore, owners of vessel.

W. B. KEENE.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram.

WESTWEGO.—W. L., 300, 450, 600.

WILLIAM CHATHAM.—Name changed to *Santa Rita*.

WYOMING.—W. L., 300, 600.

YAGUEZ.—Name changed to *Rochester*.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDY, read: Rochester, b; **WKZ**, read: Alamance, b; **WMC**, read: Santa Rita, b. Strike out particulars following the call signals, **KVU**, **KYF**, **KZD**, **KZT**, **WLN**, **WLO**, and **WZH**.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

ATLANTA, GA.—Strike out all particulars.

CAMBRIDGE, MASS.—W. L., 300, 550, 600.

HARTFORD, CONN. (1ZC).—Strike out all particulars.

NEW YORK, N. Y. (2YM).—W. L., 300, 400, 600, 2400.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out 1ZC and 4XG.

MISCELLANEOUS.

INCREASE IN SALARIES OF ALASKA STEAMSHIP CO. RADIO OPERATORS.

The Alaska Steamship Co. has advised the Department that the schedule of salaries of their radio operators has been increased as follows:

Grade.	Former salary.	Present salary.
Junior operator.....	\$50	\$55
Senior operator.....	55	60
Combination operator.....	65	75

A combination operator is one who, in addition to his radio duties, assists in the work of the freight clerk while not on watch in the radio room. The salary of a freight clerk is \$90 per month, and vacancies for this position are filled by promotion from radio operator. By this policy radio operators of this company may rise, by promotion, to the highest position which the company has to offer on board ship.

NEW NAVAL RADIO SERVICE REGULATION.

The Superintendent of the Naval Radio Service announces that, effective on and after July 1, 1916, it will be obligatory on the part of a sender of radiograms to be handled by the Naval Radio Service to indicate in the address of the message the class of vessel it is desired to reach by this service, such as "SS" (steamship or steamer) or "USS" (United States ship), as the case may be. Example:

[Radio.]

John Doe
USS New Hampshire
Charleston, S. C.

This order becomes necessary, owing to the confusion in proper handling of such traffic, inasmuch as a large number of names of ships are the same as those of cities, towns, etc.

The extra word will be charged for and counted in the check.

AMENDMENT.

[To be cut out and pasted in copy.]

The Radio Laws and Regulations of the United States, edition of July 27, 1914, are hereby amended as follows:

Paragraph 126, page 64, amended July 1, 1916, to read:

The code test shall continue for 5 minutes at a speed of 20 words, 12 words, and 5 words a minute, respectively, for the commercial first, second, and lower grades, 5 letters, numerals, or other characters to the word, and to qualify the applicant must receive 20, 12, or 5 words in consecutive order accurately and legibly written. Operators will not be permitted to break or interrupt while receiving or to correct or alter the transcription after it has been submitted to the examining officer.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, August 1, 1916—No. 20

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WASHINGTON, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

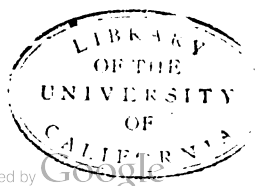
Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.



NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Latitude and longitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Beaumont, Tex. ¹	O 94 07 00	WOD	300	Kilbourne & Clark, 1,000....	300,600
	N 30 06 00				
Carney's Point, N. J. ²	O 75 27 00	WPO	100	Composite, 800.....	300,425,600
	N 39 43 00				
Port Walter, Alaska ³	O 134 40 00	KEQ	100	Tyee, 240.....	300,500,525,600
	N 56 20 00				
Wilmington, Del. ⁴	O 75 32 52	WPP	300	Composite, 200.....	300,425,600
	N 39 44 16				

¹ Service, PG; hours, 3 s-11 s; rates, 6 c. per word 60 c. minimum per radiogram. Radio station operated and controlled by the Magnolia Petroleum Co.

² Service, limited commercial; hours, X. Radio station operated and controlled by E. I. du Pont de Nemours & Co. Station is restricted to communicate with a station at Wilmington, Del.

³ Service, limited commercial. Radio station operated and controlled by the Alaska Herring & Sardine Co.

⁴ Service, limited commercial; hours, X. Radio station operated and controlled by E. I. du Pont de Nemours & Co. Station is restricted to communicate with a station at Carney's Point, N. J.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Cyrus W. Field ¹	WXS	U. S. Army, 120.....	600	Government.
Harstele.....	KEW		300,600	J. D. Hardin, jr.
Juneau ²	WAM	Kilbourne & Clark, 120.....	300,600	Alaska S. S. Co.
Maitland No. 1 ³	WLE	Marconi.....	300,600	Toronto, Hamilton & Buffalo Ry. Co.
Mariposa ⁴	WHP	Kilbourne & Clark, 1,000....	300,455,525,600.	Alaska S. S. Co.
Seafarer.....	WPL			Seafarer Navigation & Salvage Co.
Theodore Roosevelt ⁵	WCT	Marconi, 480.....	300,600	Roosevelt S. S. Co.
Valdez ⁶	WAK	Kilbourne & Clark, 240.....	300,600	Alaska S. S. Co.

¹ Range, 130; service, O. Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

² Range, 100; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the owner of vessel.

³ Service, PG; rates, 2 c. per word 20 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.

⁴ Range, 200; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the owner of vessel.

⁵ Range, 100; service, PG; hours, X; rates, 2 c. per word 20 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.

⁶ Range, 100; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.		Call signal.	Name.	
KEQ	Port Walter, Alaska.....	c	WLE	Maitland No. 1.....	b
KEW	Harstele.....	b	WOD	Beaumont, Tex.....	c
WAK	Valdez.....	b	WPL	Seafarer.....	b
WAM	Juneau.....	b	WPO	Carney's Point, N. J.....	c
WCT	Theodore Roosevelt.....	b	WPP	Wilmington, Del.....	c
WHP	Mariposa.....	b	WXS	Cyrus W. Field.....	b

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

Station.	Call signal.	Wave length.	Service.	Hours.	Station controlled by—
Hoquiam, Wash.....	7ZA	200, 300, 425, 600.....	P	X	Donald E. McGee.
Jacksonville, Ill.....	9YH	Variable to 425.....	P	X	Illinois Woman's College.
Lamoni, Iowa.....	9YO	200, 350, 425.....	P	X	Graceland College.
Monterey, Cal. (portable)	6XE	300, 600. Variable.....	P	X	National Radio Co.
Omaha, Nebr.....	9XU	800.....	P	X	Union Pacific R. R. Co.
Pittsburgh, Pa.....	8XK	450, 2,000. Variable.....	P	X	Frank Conrad.
Pottsville, Pa.....	8ZR	800, 425.....	P	X	Cotesworth M. Jackson.
Rapid City, S. Dak.....	9ZR	200, 425.....	P	X	S. R. Halley.
Salt Lake City, Utah.....	6ZI	200, 425.....	P	X	Stephen H. Besley.
San Francisco, Cal.....	6XI	300, 600. Variable.....	P	X	Clarence W. Smith.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
6XE	Sixth district: Monterey, Cal.	8ZR	Elighth district—Continued. Pottsville, Pa.
6XI	San Francisco, Cal.		Ninth district:
6ZI	Salt Lake City, Utah.	9XU	Omaha, Nebr.
7ZA	Seventh district: Hoquiam, Wash.	9YH	Jacksonville, Ill.
8XK	Elighth district: Pittsburgh, Pa.	9YO	Lamoni, Iowa.
		9ZR	Rapid City, S. Dak.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P=private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s =p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

NOTICE.

It will be noted that the additions, alterations, and corrections contained in this Bulletin apply to the List of Radio Stations of the United States, edition of July 1, 1916, which is now in the hands of the printer, although it is not possible at this time to anticipate its delivery. All additions, alterations, and corrections appearing in this and later editions of the Bulletin should be saved and inserted in the new annual list as soon as it is received.

A sufficient number of blank pages will be inserted in the back of the new list in order that these particulars may be clipped and pasted therein, enabling radio operators and others concerned to keep their annual list up to date with very little trouble.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

AKRON, OHIO.—System, Composite, 480; W. L., 300, 600, 2000; service, limited commercial.

BURRWOOD, LA.—System, Wireless Specialty Apparatus Co., 1000; W. L., 300, 600, 2200.

DETROIT, MICH. (WOK).—W. L., 300, 600, 2160; service, limited commercial.

HUNTINGTON HARBOR, NORTHPORT, L. I., N. Y.—Strike out all particulars.

PORTLAND, OREG. (KDP).—W. L., 200, 300, 425, 550, 600. Note, Radio station operated and controlled by Charles L. Austin. The station is limited to communication with vessels entering and leaving the port of Portland, or bound to or from Columbia River points, and with amateurs.

PORT MOLLER, ALASKA.—Rates, 6 c. per word 60 c. minimum per radiogram.

WASHINGTON, D. C. (NZZ).—Call, NZW.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ACHILLES.—Range, 500; system, Telefunken, 1000; W. L., 300, 450, 600, 750, 950, 1200; service, PG; hours, N; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Panama Railroad Co. Maryland Steel Co., owner of vessel.

ACME.—Range, 150; system, Marconi, 1000; W. L., 300, 600; hours, X.

ADMIRAL WATSON.—W. L., 300, 450, 600.

ALABAMA (WFB).—System, Marconi, 480; hours, N.

ALASKA.—W. L., 300, 435, 510, 600; hours, N.

ALICIA.—Range, 60; system, De Forest arc; rates, 4 c. per word 40 c. minimum per radiogram.

AROLINE.—Range, 200; system, Kilbourne & Clark, 1000; W. L., 300, 440, 520, 600; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Pacific-Alaska Navigation Co., owner of vessel.

ATLANTIC.—System, Marconi, 480; rates, North & South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Wilmore Steamship Co. (Inc.), owner of vessel.

AZTEC (KZC).—Range, 150; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. A. C. Burrage, owner of vessel.

BAYAMON.—Name, Vacuum.

CITY OF LOWELL.—System, Fessenden, 260; W. L., 300, 550, 600.

- CLINCHER.—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Clinchfield Navigation Co., owner of vessel.
- COLOMBIA.—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Pacific Mail Steamship Co., owner of vessel.
- CONNEAUT.—Range, 100; system, Marconi, 480; service, PG; hours, X.
- ECUADOR.—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Pacific Mail Steamship Co., owner of vessel.
- ENTERPRISE.—System, Marconi, 1000; W. L. 300, 450, 600.
- GEORGE E. PADDLEFORD.—Range, 200; system, Marconi, 1000; hours, X.
- GEORGIANA.—Name, *Norlina*. Note, Radio station operated and controlled by the Marconi Co. Garland Steamship Corporation, owner of vessel.
- GOV. FORBES.—Name, *Governor Forbes*; range, 300. Note, Radio station operated and controlled by Ynchausti & Co., owner of vessel.
- GULFOIL.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- J. M. GUFFEY.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- JOHN A. HOOPER. Note, Radio station operated and controlled by the Marconi Co. W. R. Grace & Co., owner of vessel.
- MARQUETTE and BESSEMER No. 1.—System, Kilbourne & Clark, 240; W. L., 300, 425, 540, 600. Service, limited commercial. Note, Radio station operated and controlled by the Marquette & Bessemer Dock & Navigation Co., owner of vessel. Station is limited to communication with the *Marquette & Bessemer No. 2.* and a coast station at Conneaut Harbor, Ohio.
- ORLEANIAN.—Service, PG.
- PERU.—System, Marconi, 480.
- PETOSKEY.—Range, 100; system, Marconi, 480; service, PG; hours, X.
- RICHARD.—Strike out all particulars.
- SATELLITE (KPS).—Strike out all particulars.
- TATOOSH.—Rates, 4 c. per word 40 c. minimum per radiogram.
- TORMENTER.—Range, 100; system, Marconi, 240; service, PG; hours, X.
- VENEZUELA.—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Pacific Mail Steamship Co., owner of vessel.
- WAKIVA.—Range, 150; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. H. S. Harkness, owner of vessel (yacht).
- WAPAMA.—Note, Radio station operated and controlled by the Marconi Co. Chas. R. McCormick & Co., owner of vessel.
- WAYFARER.—Name, *Warrior*; range, 300; system, Marconi, 480; W. L., 300, 600; service, P; hours X. Note, Alexander S. Cochran, owner of vessel (yacht).
- WESTOIL.—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- WINFRED.—System, Marconi, 400; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- W. S. PORTER.—Strike out system. Note, Associated Oil Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDX, read: Vacuum b; KJE, read: *Norlina* b; KYW, read: *Warrior* b; WJA, read: *Governor Forbes* b.

Strike out all particulars following the call signals KPS, WL.G. and WLM.

Strike out particulars following call signal NZY, and insert *Washington, D. C.*, after call signal NZW.

MISCELLANEOUS.**ARGENTINE WIRELESS AND CABLE REGULATIONS.**

On May 8 the Argentinian Government promulgated the following decree relating to the transmission of cable and wireless messages proceeding from or destined to Europe, Africa, Asia, or Oceania:

ARTICLE 1. Cable and wireless messages from, for, or in transit through the Argentine Republic, proceeding from or destined to Europe, Africa, Asia, or Oceania, will be accepted at the risk of the senders and submitted to censorship.

ART. 2. Messages the contents of which might affect Argentine neutrality shall not be received.

ART. 3. Any language or speech is permitted for the form of such messages, bearing in mind the restrictions imposed by countries of transit and destination, and, with respect to messages in secret language, those the respective codes of which may have been previously authorized by the management of posts and telegraphs.

It is understood that the provisions of the decree in nowise affect messages to or from the United States nor messages in transit from South American countries.

RADIOTELEGRAPHIC TARIFF FOR SOCIETY ISLANDS.

By a decree of the governor the radiotelegraphic tariff for the Society Islands was proclaimed on May 6, 1916.

The tariff now in effect fixes the local rate at 12 cents a word (10 cents radio charge and 2 cents telegraphic charge from Papeete to the station at Mahina). There is an additional charge of 1 shilling (24 cents) a word for relaying via the radio stations at Apia, Samoa, and Awanui, New Zealand (6 pence (12 cents) per word for each station). To these rates must be added the charges of other systems for the delivery of the message at its final destination. The cost per word from Tahiti to Washington amounts to \$1.11.

COMMUNICATING WITH VESSELS AT SEA—REGISTRATION OF CABLE ADDRESSES.

The tariff also fixes the rate between the colony and vessels at sea. The cost per word in direct communication with a vessel within call of the station at Mahina is: Local charge 12 cents, plus ship's charge of 8 cents. The cost per word in communicating with a vessel by relay through Apia, Samoa, is: Local rate 12 cents, plus 12 cents for transmission by latter station, plus 8 cents vessel's charge, or 32 cents a word. When the communication reaches a vessel through two relaying stations (Apia and Awanui) the charge is: Local rate 12 cents, plus 1 shilling (6 pence for each station), plus 4 pence ship's rate, or 44 cents a word.

The rate of exchange from French to English currency, and vice versa, is fixed by decision of the colonial governor whenever required and in conformity with the international telegraphic regulations.

Under the newly established radio service, the registration of cable addresses in the colony is not provided for. Communications must be fully or sufficiently addressed to permit of the complete identification of the addressee. During the continuance of the war the strict censorship in New Zealand, through which all messages for Tahiti must pass, will not permit the transmission of communications whose

mode of address leaves in doubt the addressee's identity, or if the language of the message is other than English or French. Communications in code (private or international) will, therefore, not be accepted at New Zealand or at Tahiti.

RADIO SERVICE STATISTICS.

Class and number of radio station licenses issued, 1915 and 1916.

Class.	1915	1916	Class.	1915	1916
Commercial ship.....	362	444	Technical and training school....	15	33
General public service, land.....	41	51	Special amateur.....	37	67
Limited public service, land.....	11	17	General and restricted amateur....	3,510	4,875
Limited commercial, land.....	22	57			
Experimental.....	41	57	Total.....	4,039	5,601

The total number of station licenses issued to July 1, 1916, are as follows: 1913, 1,496; 1914, 2,309; 1915, 4,039; 1916, 5,601; total, 13,445.

Grade and number of radio operators' licenses issued.

Grade.	1913	1914	1915	1916	Total.
Commercial extra first.....			18	18	36
Commercial first and second.....	1,932	339	1,635	1,260	5,166
Experiment and instruction.....	8	10	27	30	75
Cargo.....	1	26	112	173	312
Amateur first and second.....	1,841	1,172	3,067	4,199	10,279
Total.....	3,782	1,547	4,859	5,680	15,868

Clearances and inspections of ships by districts.

1916	First, Boston.	Second, New York.	Third, Baltimore.	Fourth, Savannah.	Fifth, New Orleans.	Sixth, San Francisco.	Seventh, Seattle.	Eighth, Cleveland.	Ninth, Chicago.	Total.
Clearances ¹	1,238	3,196	1,293	1,275	915	1,871	879	344	100	11,111
Inspections ¹	544	2,630	550	21	523	1,206	552	53	46	6,125
Inspections ²	27	186	45	.....	65	93	174	150	371	1,111
Total inspections, 1916 ^{1,2}	571	2,816	595	21	588	1,299	726	203	417	7,236
Total inspections, 1915 ^{1,2}	428	2,382	569	13	665	1,517	356	138	84	6,152

¹ Vessels subject to the act of June 24, 1910, amended July 23, 1912, requiring radio apparatus on certain vessels.

² Vessels subject to the act of Aug. 13, 1912, voluntarily equipped with radio apparatus.

The total number of inspections for the fiscal years 1913 to 1916, inclusive, is as follows: 1913, 3,201; 1914, 6,486; 1915, 6,152; 1916, 7,236; total, 23,075.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, September 1, 1916—No. 21

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WASHINGTON, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Range.	Wave lengths.	Service.	Hours.	Station controlled by—
Latouche, Alaska ¹	KIM	150	300, 450, 600, 1650	PG	.....	Kennecott Copper Corporation.
Portland, Me. ²	WXV	30	.....	O	X	National Guard, State of Maine.

¹ System, Kilbourne & Clark, 1,000; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram.

² System, U. S. Army, 1,000.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Service.	Hours.
Adams ¹	NTI	U. S. Navy.....	300, 600	PG	N
Allen ¹	NJD	do.....	300, 600	PG	N
Arizona ¹	NBW	do.....	300, 600	PG	N
Balboa ¹	WHU	Marconi.....	300, 600	PG	N
Barry ¹	NIC	U. S. Navy.....	300, 600	PG	N
Blakely ¹	NVX	do.....	300, 600	PG	N
Bushnell ¹	NZC	do.....	300, 600	PG	N
Callao ²	WHF	Haleum, 450.....	300, 600	PG	X
Chauncey ¹	NIF	U. S. Navy.....	300, 600	PG	N
Conyngham ¹	NJE	do.....	300, 600	PG	N
D-1 ¹	NXP	do.....	300, 600	PG	N
D-2 ¹	NXQ	do.....	300, 600	PG	N
D-3 ¹	NXR	do.....	300, 600	PG	N
Dale ¹	NIG	do.....	300, 600	PG	N
Davis ¹	NJF	do.....	300, 600	PG	N
D. G. Scofield ⁴	WRD	Marconi.....	300, 600	PG	N
Don Juan de Austria ¹	NGI	U. S. Navy.....	300, 600	PG	N
Dorothea ¹	NTS	do.....	300, 600	PG	N
Dupont ¹	NWC	do.....	300, 600	PG	N
Ericsson ¹	NIS	do.....	300, 600	PG	N
Essex ¹	NMY	do.....	300, 600	PG	N
Fort Bragg ⁵	WLH	Haleum.....	300, 600	PG	N
Fortune ¹	NVL	U. S. Navy.....	300, 600	PG	N
Fulton ¹	NZD	do.....	300, 600	PG	N
General Mifflin ⁶	WZX	U. S. Army, 1,000.....	400	O	X
Gopher ¹	NNY	U. S. Navy.....	300, 600	PG	N
H. C. Folger ⁷	KHS	Marconi.....	300, 600	PG	N
J. W. Van Dyke ⁷	KHR	do.....	300, 600	PG	N
Kanawha ¹	NND	U. S. Navy.....	300, 600	PG	N
L-1 ¹	NYN	do.....	300, 600	PG	N
L-2 ¹	NYO	do.....	300, 600	PG	N
L-3 ¹	NYP	do.....	300, 600	PG	N
L-4 ¹	NYQ	do.....	300, 600	PG	N
L-9 ¹	NYV	do.....	300, 600	PG	N
L-10 ¹	NYW	do.....	300, 600	PG	N
L-11 ¹	NYX	do.....	300, 600	PG	N
M-1 ¹	NYZ	do.....	300, 600	PG	N

¹ Rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the United States Naval Communication Service, Radio, Va. Government, owner of vessel.

² Columbian Maritime Co., owner of vessel.

³ Range, 150. Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by George M. McNear (Inc.), owner of vessel.

⁴ Radio station operated and controlled by Standard Oil Co. of California, owner of vessel.

⁵ Radio station operated and controlled by Charles H. Higgins, owner of vessel.

⁶ Range, 30. Radio station operated and controlled by United States Signal Corps, War Department. Government, owner of vessel.

⁷ Atlantic Redding Co. (Philadelphia), owner of vessel.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—continued.

Vessel.	Call signal.	System.	Wave lengths.	Service.	Hours.
Major Guy Howard ¹	WZY	U. S. Army, 1,000.....	400	O	X
Manga Reva ²	KIP	Marconi, 400.....	300, 600	PG	X
Marina Quezada ³	KHP				
Maumee ⁴	NNE	U. S. Navy.....	300, 600	PG	N
Melville ⁴	NKA	do.....	300, 600	PG	N
Memphis ⁴	NUG	do.....	300, 600	PG	N
Morris ⁴	NWS	do.....	300, 600	PG	N
Nevada ⁴	NCA	do.....	300, 600	PG	N
Oklahoma ⁴	NCB	do.....	300, 600	PG	N
Olympia ⁴	NGG	do.....	300, 600	PG	N
Pennsylvania ⁴	NCE	do.....	300, 600	PG	N
Patrol ⁵	WIP	Composite, 500.....	500, 325 (6)	X	
Porter ⁴	NOO	U. S. Navy.....	300, 600	PG	N
Quiros ⁴	NQZ	do.....	300, 600	PG	N
Ransom B. Fuller ⁷	KRF	Marconi, 480.....	300, 600	PG	X
Resolute ⁸	KRM				
Rowan ⁴	NKR	U. S. Navy.....	300, 600	PG	N
Sampson ⁴	NKS	do.....	300, 600	PG	N
San Diego ⁴	NCZ	do.....	300, 600	PG	N
San Francisco ⁴	NTQ	do.....	300, 600	PG	N
San Pedro ⁹	WZZ	U. S. Army, 1,000.....	400	O	X
Severn ⁴	NZB	U. S. Navy.....	300, 600	PG	N
Sterling ⁴	NNL	do.....	300, 600	PG	N
Tampa ¹⁰	NRQ	U. S. C. G., 1,000.....	{ 300, 600, 750, 1,000 }	PG	N
Tucker ⁴	NKV	do.....	300, 600	PG	N
Vixen ⁴	NSU	do.....	300, 600	PG	N
Wadsworth ⁴	NKW	do.....	300, 600	PG	N
Wainwright ⁴	NKX	do.....	300, 600	PG	N
Wilkes ⁴	NKQ	do.....	300, 600	PG	N
Wolverine ⁴	NGW	do.....	300, 600	PG	N
Yantic ⁴	NHX	do.....	300, 600	PG	N

¹ Range, 30. Radio station operated and controlled by United States Signal Corps, War Department. Government, owner of vessel.

² Range, 200. Rates, North and South American service 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by Marconi Co. Brynhilda Shipping Corporation, owner of vessel.

³ Edwin C. Gregory, owner of vessel.

⁴ Rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the United States Naval Communication Service, Radio, Va. Government, owner of vessel.

⁵ Range, 5. Radio station operated and controlled by city of Seattle, harbor department. City of Seattle, owner of vessel.

⁶ Service, limited commercial.

⁷ Range, 200. Rates, North and South American service 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by Marconi Co. Eastern Steamship Corporation, owner of vessel.

⁸ Merritt & Chapman Derrick & Wrecking Co., owner of vessel.

⁹ Range, 30. Radio station operated and controlled by United States Signal Corps, War Department. Government, owner of vessel.

¹⁰ Range, 300. Rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by United States Coast Guard. Government, owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship stations; c—land stations.]

Call signal.	Name.	Call signal.	Name.
KHP	Marina Quezada.....b	NQI	Don Juan de Austria.....b
KHR	J. W. Van Dyke.....b	NQZ	Quiros.....b
KHS	H. C. Folger.....b	NiQ	Tampa.....b
KIM	Latouche, Alaska.....c	NSU	Vixen.....b
KIP	Manga Reva.....b	NTI	Adams.....b
KRF	Ransom B. Fuller.....b	NTQ	San Francisco (NTQ).....b
KRM	Resolute.....b	NTS	Dorothea.....b
NBW	Arizona.....b	NUG	Memphis.....b
NCA	Nevada.....b	NVL	Fortune.....b
NCB	Oklahoma.....b	NVX	Blakely.....b
NCE	Pennsylvania (NCE).....b	NWC	Dupont.....b
NCZ	San Diego.....b	NWS	Morris.....b
NGG	Olympia.....b	NXP	D-1.....b
NGW	Wolverine.....b	NXQ	D-2.....b
NHX	Yantie.....b	NXR	D-3.....b
NIC	Barry.....b	NYN	L-1.....b
NIF	Chauncey.....b	NYO	L-2.....b
NIG	Dale.....b	NYP	L-3.....b
NIS	Ericsson.....b	NYQ	L-4.....b
NJD	Allen.....b	NYV	L-9.....b
NJE	Conyngham.....b	NYW	L-10.....b
NJF	Davis.....b	NYX	L-11.....b
NKA	Melville.....b	NYV	M-1.....b
NKQ	Wilkes.....b	NZB	Severn.....b
NKR	Rowan.....b	NZC	Bushnell.....b
NKS	Sampson.....b	NZD	Fulton.....b
NKV	Tucker.....b	WHF	Callao.....b
NKW	Wadsworth.....b	WHU	Balboa.....b
NKX	Wainright.....b	WIP	Patrol.....b
NMY	Essex (NMY).....b	WLH	Fort Bragg.....b
NND	Kanawha.....b	W'D	D. G. Scofield.....b
NNE	Maumee.....b	WXV	Portland, Me.....c
NNL	Sterling.....b	WZX	General Mifflin.....b
NOO	Porter.....b	WZY	Major Guy Howard.....b
NNY	Gopher.....b	WZZ	San Pedro.....b

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

Station.	Call signal.	Wave length.	Service.	Hours.	Station controlled by—
New York, N. Y. (2 YT).....	2YT	200, 300, 600	P	X	Marconi Co.
San Francisco, Cal. (6 XW).....	6XW	300, 450, 600	P	X	Eldridge Buckingham.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name = Name of station.

G. loc = Geographical location: O=west longitude, N=north latitude.

Call = Call letters assigned.

System = Radio system used and sparks per second.

Range = Normal range in nautical miles.

W. L. = Wave lengths assigned: Normal wave lengths in italics.

Service = Nature of service maintained:

PG = General public.

PR = Limited public.

P = private.

O = Government business exclusively.

Hours = Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s =p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

NOTICE.

It will be noted that the additions, alterations, and corrections contained in this Bulletin apply to the List of Radio Stations of the United States, edition of July 1, 1916, which is now in the hands of the printer, although it is not possible at this time to anticipate its delivery. All additions, alterations, and corrections appearing in this and later editions of the Bulletin should be saved and inserted in the new annual list as soon as it is received.

A sufficient number of blank pages will be inserted in the back of the new list in order that these particulars may be clipped and pasted therein, enabling radio operators and others concerned to keep their annual list up to date with very little trouble.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

BALTIMORE, MD.—System, Marconi-United, 240; W. L., 300, 450, 600.

BOSTON, MASS. (WCH).—Strike out all particulars.

CAPE ST. ELIAS, ALASKA.—Service, 0.

CLEVELAND, OHIO.—Hours, 8m-12m, 12.30s-7s, 8s-11s, 12s-7m.

EUREKA, CAL. (KPM).—W. L., 300, 530, 600.

ISLE ROYAL, MICH.—Strike out all particulars.

KOGGIUNG, ALASKA (KVV).—Service, PG.

LOS ANGELES, CAL. (KEX).—Strike out all particulars.

NAVASSA ISLAND.—System, Bureau of Standards, 1,000; W. L., 600, 750; service, limited commercial; hours, X. Notes: Radio station operated and controlled by Snare & Triest Co. United States Government (Bureau of Lighthouses), owner. The station is restricted to communication with Guantanamo, Cuba, and Bowden, Jamaica.

NEW LONDON, CONN. (NRZ).—G. loc., 72° 05' 40"—N. 41° 22' 40"; range, 100; system, U. S. Coast Guard, 120.

NEWPORT, R. I. (WCI).—Range, 100; system, National Electric Signaling Co., 1,000; hours, 7s-6m.

PROVIDENCE, R. I.—System, Marconi, 120; W. L., 300, 450, 600.

RIVER ROUGE, MICH. (WDR).—Note: This station is open during season of navigation only.

ROCHE HARBOR, WASH.—Strike out all particulars.

SAULT STE. MARIE, MICH.—Strike out all particulars.

SEATTLE, WASH. (KPE).—Range, 100; system, composite, 120; W. L., 300, 575, 600.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ADMIRAL FARRAGUT.—System, Kilbourne & Clark, 240; W. L., 300, 450, 515, 600.

ALASKAN.—Hours, X.

ARDMORE.—W. L., 300, 450, 600.

BUNKER HILL.—W. L., 300, 450, 600.

CALVIN AUSTIN.—System, Marconi, 400.
 CITY OF BANGOR.—System, Marconi, 480.
 CLINCHER.—Range, 250, system, Marconi, 1,000; hours, X.
 CORDOVA.—Hours, X.
 CORWIN.—Strike out all particulars.
 DOROTHY BRADFORD.—Note: Apparatus for emergency use only; not open to public service. Cape Cod Steamship Co., owner of vessel.
 ECUADOR.—Range, 200; system, Marconi, 240; hours, N.
 HALCYON.—System, Marconi; W. L., 300, 450, 600.
 HERBERT G. WYLIE.—W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
 J. M. DANZIGER.—Range, 250; system, Marconi, 1,000; hours, X.
 MIAMI (NRQ).—Strike out all particulars.
 NANN SMITH.—Strike out all particulars.
 OLD COLONY.—Strike out all particulars.
 RESTORER.—Hours, X. Note: Radio station operated and controlled by Marconi Co.
 SIALIA.—System, Telefunken, 1,000; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service 8 c. per word 80 c. minimum per radiogram. Notes: Radio station operated and controlled by estate of J. K. Stewart, owner of vessel.
 STANDARD ARROW.—Range, 250; system, Marconi, 1,000; hours, X.
 TOPILA.—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
 ULYSSES.—Range, 300; system, Kilbourne & Clark, 1,000; service, PG; hours, N; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram. Note: Radio station operated and controlled by Panama Railroad Co.
 VACUUM.—Range, 250; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
 W. S. PORTER.—W. L., 300, 600; 1,800.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all the particulars following the call signals: KEX, KJO, KRW, NRQ, WBO, WCH, WNN, WRO, and WSI.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

ANN ARBOR, MICH.—450, 600, 1,100, 2,000.
 FARMINGTON, CONN.—Strike out all particulars.
 ITHACA, N. Y. (8XU).—Call, 8XU; W. L., variable.
 MEMPHIS, TENN. (5XC).—Strike out all particulars.
 NEW YORK, N. Y. (2XH).—Strike out all particulars.
 NEW YORK, N. Y. (2XR).—Strike out all particulars.
 NEW YORK, N. Y. (2YS).—W. L., 250, 300, 600. Note: Radio station operated and controlled by Joseph G. Baier (Stuyvesant High School Radio Club).
 OAKLAND, CAL. (6XC).—Strike out all particulars.
 OAKLAND, CAL. (6XT).—Strike out all particulars.
 SEATTLE, WASH. (7XM).—Strike out all particulars.
 STEAMSHIP *Tyler*.—Strike out all particulars.
 WARREN, OHIO.—Strike out all particulars.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all the particulars following the call signals: 1ZZ, 2XH, 2XR, 2XT, 5XC, 6XC, 6XT, 7XM, and 8XW.

MISCELLANEOUS.

MARINE DISASTERS IN WHICH WIRELESS FIGURED DURING FISCAL YEAR 1916.

1915.

July 2.—Steamship *Panuco* grounded at entrance to South Pass, La., with a crew of 35 aboard. Aid was summoned by wireless and the vessel was floated.

July 10.—The pilot boat *New Jersey* was rammed and sunk by the United Fruit steamer *Manchioneal* at the eastern entrance to Ambrose Channel. The steamship *Manchioneal* saved the crew, but the SOS calls sent out brought assistance promptly, which, however, was not needed.

July 11.—The *Invermore* was wrecked near Brig Harbor, Labrador. The distress call was sent by radio and the necessary aid was obtained.

July 15.—The steamship *Jutlandia* ran aground north of Gatun Locks, Panama Canal. The vessel was rescued, however, and no lives were lost.

July 22.—The steamship *Sucha*, while on fire in the Gulf of St. Lawrence, signaled for help by wireless, which was received by the *Royal George*, and the latter vessel proceeded to the rescue of the *Sucha*, but later received word by wireless that the fire had been extinguished and that assistance was not needed.

August 2.—The steamship *Georgian* went aground off Duxbury Reef. The steamship *Harvard* responded to the SOS call and no lives were lost.

August 4.—The *Emma Angel* was storm-battered and water-logged 45 miles south-east of the Highlands and signaled to the *Bermudian* near-by, which sent a wireless distress call, to which the *Seneca* responded and all on board were saved.

August 18.—The *El Sud* grounded on Galveston Bar. The tug *Senator Bailey* responded and brought the necessary assistance.

August 19.—The steamer *Baron Erskine* when one day from Avonmouth was torpedoed by a submarine. There were 108 persons on board, but no lives were lost.

August 20.—The steamer *Marowijne* is supposed to have been sunk in a storm in the Gulf of Mexico. Nothing definite is known in regard to this disaster and probably never will be.

August 23.—Steamship *Melapan* grounded in Cartagena Harbor. There were 45 passengers and 19 in crew. The cargo was promptly discharged into lighters and steamer subsequently floated.

August 29.—Steamship *Admiral Watson* rammed by the steamship *Paraiso* while lying in dock, Seattle, Wash., sinking in 10 minutes. All aboard were saved with the exception of one person.

August 30.—Steamship *Edith*, of the Alaska Steamship Co., when 40 miles north-east of Cape St. Elias, listed badly on account of shifting of cargo of copper concentrates. The SOS call brought the necessary aid and all on board were saved. The fate of the vessel, however, has not been definitely learned.

September 13.—Steamship *Sant Anna*, of the Fabre Line, was on fire in mid-ocean, latitude 40° 23' north, longitude 47° 30' west. The SOS call brought the *Ancona*, which took off 600 persons and convoyed the distressed vessel to port. The *Sant Anna* carried 1,700 persons in addition to the crew.

September 19.—Steamship *Athinai* was destroyed by fire in mid-ocean, latitude 40° 54' north, longitude 58° 47' west. The *Tuscania* and *Romanian Prince* responded, resulting in the saving of 470 lives.

October 8.—Steamship *Mariposa* grounded and sank on rocky shore in Ilama Passage, off Pointer Island, British Columbia. The SOS call was heard by two vessels. The *Despatch*, being within 30 miles, responded and rescued the 139 persons on board.

November 22.—Steamship *Santa Clara* was wrecked on jetty at Coos Bay, Oreg. Wireless succeeded in bringing a vessel to the aid of the wrecked ship and 93 persons were saved.

November 5.—The steamship *Fort Bragg* grounded in Gulf of California. The U. S. S. *San Diego* responded to the distress call and 47 persons were rescued.

November 5.—The steamship *Rio Lages* caught fire in mid-ocean, latitude 41° 58' north, longitude 59° 30' west. Distress calls were sent and all on board were saved.

November 8.—The steamship *Rochambeau* caught fire at sea and sent SOS call by wireless; later, however, she sent another message stating that the fire was under control.

November 9.—Steamship *Lievatta* (Italian), loaded with cased kerosene and gasoline, caught fire 65 miles east of Sabine Bar, Tex.; reported by wireless by steamship *Gulfstream*, which vessel stood by the burning steamer until other assistance, summoned by wireless, arrived from Port Arthur and Galveston. Without the assistance thus secured the vessel and cargo would have been a total loss.

November 27.—The steamship *Minnesota*, when 760 miles south of San Francisco, sent wireless stating that machinery was disabled. The necessary aid was rendered by the *Iroquois* and the tug *Dauntless*, which responded promptly upon hearing the distress call.

December 1.—Steamship *Flamenco* ran aground at South Pass, La. The accident was reported by wireless and rescue soon followed.

December 13.—Steamship *Antilla* collided with a barge beached off Sea Gate. Wireless was instrumental in saving the cargo.

December 27.—Steamship *Thessaloniki* sprung a leak about 400 miles southeast of Sandy Hook. Several vessels responded to the distress call and 300 persons were saved.

1916.

January 1.—Steamship *Vandeggen*, not equipped with wireless, showed signals of distress, which were seen by the steamship *Muskogee*. Message sent broadcast giving position of disabled steamer, which was later towed to port.

January 17.—Car ferry *Pere Marquette No. 19* went aground 4 miles north of Ludington, Mich., 7.40 p. m. Wireless communication established with Ludington and *Pere Marquette* car ferries Nos. 17 and 18, which were advised not to come in close on account of shoal water. Wireless used throughout salvage operations.

January 19.—Steamship *Pollentia*, 706 miles off Cape Race, in latitude 36° 30', longitude 35° 04', sinking, called SOS. Immediately answered by steamships *America*, *Guisepppe Verdi*, *Moncenisio*, *Westerdyk*, and *Narragansett*. Crew of 35 rescued by boats from *Guisepppe Verdi*, while *Narragansett* poured oil on waves.

January 22.—Steamship *Centralia*, off Columbia River, heavy seas washed away deck load, broke rudder, and flooded engine and wireless rooms. Aerial carried away, but repaired by operator, who then called SOS. Answered at once by steamships *Governor*, *Adeline Smith*, *Yosemite*, *Admiral Schley*, *Eurana*, and land stations at Marshfield and Eureka. Weather and sea finally moderated and ship made San Francisco safely without assistance.

January 23.—Steamship *Brazos* and steamship *Suffolk* in collision 23 miles south-east Scotland Light in dense fog. Wireless communication informed agents of accident and vessel returned to New York for repairs.

January 24.—Steamship *Frank H. Buck* when 355 miles north of San Francisco lost her rudder. Wireless used to summon aid.

January 26.—Steamship *Proteus* in collision with steamer *Brabant* below the narrows, New York Harbor. Wireless messages informed agents of accident which, however, was not serious.

January 30.—Steamship *Philadelphia* in collision with sailing ship *Ben Lee* 12 miles south of Carnavon Bay. Wireless used in notifying agents of accident.

February 1.—Steamship *Takata Maru* in collision with steamship *Silver Shell*; SOS answered by radio stations at Boston and Cape Race and various steamers. Crew rescued by *Silver Shell*.

February 4.—Steamship *Texas* (Swedish) reported by radio that cargo of cotton was on fire. Later reported fire under control and assistance not required.

February 4.—Steamship *Howard* in collision with barge off Point Judith. Barge sunk. Wireless used to notify owners of accident.

February 7.—Steamship *Harvard* rammed the steam schooner *Excelsior* in San Francisco Bay. Wireless calls brought immediate assistance from shore.

February 7.—Steamship *Caloria* ran aground head of South Pass, La. The distress call brought a number of tugs and lighters to her assistance.

February 15.—Steamship *Pavlof* struck an uncharted reef at 9.01 p. m. between Tugidak and Sitkanak Islands. At 9.12 p. m. SOS call was sent out and communication established with the naval radio station at Dutch Harbor. At 10 p. m. the *Pavlof* raised the naval radio station at Kodiak. The steamship *Alameda* was summoned from Cordova to the assistance of the distressed vessel, which had previously lost her propeller, and towed her to anchorage.

February 21.—Steamship *Middlesex* reported ashore inside Cross Rip. The radio operator on the steamship *Nacooche* notified the revenue cutter *Acushnet* at Woods Hole, which in turn informed the owners, thus obtaining the necessary assistance.

February 24.—Steamship *Polarine* went ashore on the 23d of February near Helsingborg. In answer to wireless distress call the steamship *Pioneer*, from Copenhagen, proceeded to assistance of stranded vessel.

February 24.—Steamship *Cretan* struck by steamship *Dorothy* 3 miles southeast Wimble Shoal buoy. SOS call sent out and answered at once by several ships. Later found assistance not required, as passengers were transferred to *Dorothy*, which was towed in by United States revenue cutter *Onondaga*. Communication with Marconi stations at Hatteras and Virginia Beach throughout.

February 28.—Steamship *Juniata* went ashore in Vineyard Sound, Mass. Communication was established by radio and repairs directed by means of wireless.

February 28.—The French auxiliary cruiser *Provence II* (so designated to distinguish her from the French battleship *Provence*) was torpedoed and sunk in the Mediterranean Sea. French and British patrol boats, which were summoned by wireless, rescued 870 persons.

February 29.—Steamship *Multnomah* struck on Viti Rock off south end of Lummi Island in heavy fog. Wireless communication established with radio station at Seattle and accident reported. Vessel backed off rock and returned to Bellingham and beached in mud flats.

March 4.—Steamship *Apache*, 45 miles off Cape Henry, had machinery disabled and anchored in 25 fathoms. In answer to wireless message wrecking tugs towed her to port.

March 5.—Steamship *Principe de Asturias* foundered off Ponta Boi near Santos. In answer to distress calls the steamship *Vega* rescued practically all of the passengers and crew, of whom there were about 1,000.

March 14.—Steamship *Kanawha* sprang a leak and sank off the coast of South Carolina. The steamship *Santa Marta* picked up 21 of crew and notified other steamers by wireless to search for the other boat containing 7 of the crew.

March 14.—Steamship *Motano* grounded off Burrwood, La. Two tugs and three lighters responded to the distress call, with the aid of which the vessel was floated. There was no loss of life or damage to the vessel.

March 16.—Steamship *Zealandia*, of the Fiske Trading Co., in distress 300 miles off Sandy Hook with steering gear disabled. Wireless messages telling of the plight of the steamship relayed to radio station at Miami by the Standard Oil steamer *Richmond* and assistance sent to the disabled steamer.

March 16.—Steamship *Macona* ashore on Barbuda Island, British West Indies. Owners notified by wireless and arrangements made with wrecking company to send tug to relief of stranded steamer.

March 16.—Steamship *Sanonofre* ran short of coal during blizzard off Newfoundland coast, 500 miles from Halifax. In response to wireless calls was taken in tow by steamship *Ashtabula* and was towed to Halifax.

March 16.—Steamship *Cubantia* sunk by mine or torpedo near Noorhinder lightship. Wireless calls for help sent out were first picked up at the Hook of Holland. All passengers and crew rescued.

March 20.—Steamship *Strombus* grounded across Southwest Pass Channel, 250 feet inside bell buoy. Several tugs responded to the distress call and succeeded in floating the vessel.

March 21.—Steamship *Bradford* leaving San Francisco had an accident to her rudder. Communication was established with the radio station at San Francisco and messages exchanged calling for assistance of vessels.

March 22.—Steamship *Minneapolis* sunk by submarine in the Mediterranean. Wireless SOS calls sent out stating that the *Minneapolis* had been torpedoed and was sinking. Calls answered by *Leicestershire* and other vessels, which went to the aid of the sinking steamer.

March 23.—Steamship *Alamo*, 130 miles northeast of Cape Hatteras, with a broken rudder and her engine disabled. Sent out wireless calls for help. A wrecking tug was sent to her assistance from Norfolk.

March 23.—Steamship *Svaland*, in latitude 44° north, longitude 55° 30' west, dismantled. Steamer *Murjek* reported a large crew on board and asked that tug be sent to assistance of distressed vessel.

March 27.—Steamship *San Cristobal*, owned by the Anglo-Mexican Petroleum Products Co., burned near her pier at Puerto, Mexico.

March 28.—Steamship *Rotterdam* grounded Southwest Pass Channel near bell buoy, with a crew of 36 on board. Several tugs responded to the distress call, and the vessel was floated March 30.

March 29.—Steamship *Siberia*, latitude 51° 8' north, longitude 7° 3' west, Irish Sea, received SOS call from British cruiser. In response the *Siberia* gave general distress call, which brought British destroyer to her assistance. The cruiser had been torpedoed by a submarine.

March 31.—Steamship *Chiyo Maru* grounded during fog on the Lema Islands. Wireless calls summoned nine tugboats and launches and a British torpedo boat destroyer, taking off 299 passengers.

April 2.—Steamship *Enterprise* broke her main shaft and damaged her stern. Wireless communication established with steamer *Manoa*, 150 miles away, and constant communication maintained all day until 8.30 p. m., when *Manoa* came alongside disabled steamer and took her in tow.

April 5.—Steamship *Patria*, of the Fabre Line, at 9.45 a. m. called SOS when 20 miles southwest Spartivento, Sardinia, Torpille Manguee. The steamship *Siberia* answered and would have hastened to aid of the *Patria* if necessary, but at 10.30 a. m. the *Patria* sent word by radio that her assistance would not be required, as the torpedo which had threatened the boat had missed her.

April 6.—Steamship *Zent*, of the Elder Line, torpedoed at Fastnet. Wireless calls for help sent out before the vessel sank brought assistance and most of the crew were rescued.

April 8.—Steamship *Madison*, Old Dominion Line, standing by two barges off Long Branch, N. J., flying distress signals. At 6.15 p. m., rescued five men from one barge and called the Coast Guard cutter *Mohawk* from New York to assistance of others.

April 8.—Schooner *Emma F. Angell*, latitude 37° 43', longitude 75° 08', sunk in collision with steamer *Cheptow Castle*. Crew of schooner rescued by latter. Accident reported by radio.

April 9.—Steamship *Guajara*, with passengers and freight from Rio for New York, 301 miles south of Scotland light, badly disabled. Wireless calls brought the steamship *Sixaola*, which vessel towed the disabled liner to Norfolk.

April 10.—Steamship *San Ramon*, Pacific Coast Line, lost her propeller at 3.30 a. m. Wireless messages through the radio station at San Francisco resulted in the sending of tugs to the assistance of the disabled steamer.

April 15.—Steamship *Wm. P. Hood* reported in distress 57 miles southwest of Five-Fathom Bank lightship by steamer *Jamestown*. Revenue cutter *Mohawk*, in answer to wireless messages, went to assistance of disabled vessel.

April 15.—Schooner *Mary E. Morse* off Hatteras in distress. Steamship *Lenape* standing by schooner and notified Norfolk by radio that dismasted schooner wished to be towed to port.

April 18.—Schooner *Millie R. Frank* observed by steamship *Madison* flying distress signals. The *Madison* informed the Coast Guard cutter *Mohawk* by wireless of the schooner's plight, which went to assistance of schooner. The crew was rescued by Toms River coast guards.

May 8.—Steamship *Philadelphian* collided with the Fire Island lightship. Communication was established by radio with the Sea Gate station, requesting that relief be sent at once. Wireless calls were responded to by the Coast Guard cutter *Mohawk*, and the damaged lightship taken in tow by the *Philadelphian* and brought to port.

May 9.—Steamship *Roanoke*, North Pacific Steamship Co., foundered and sank sometime during daylight hours. The operator, together with 47 others, lost his life; only six survivors were rescued. Two open boats were picked up by the steamer *Edgar Vance*, which notified shore stations of disaster.

May 11.—Barge *Ivie*, of the New England Coal & Coke Co., rammed and sunk in Hampton Road by steamer *Berkshire*. The *Berkshire* ashore on Hampton bar. The crew of barge rescued by steamer and owners notified of accident by radio.

May 14.—Steamship *Kandahar* on fire in Ambrose Channel. Facts reported to agent, who promptly sent fire boat from New York to assistance of burning vessel.

May 15.—Steamship *San Giovanni* and steamship *Grekland* in collision in a fog in Ambrose Channel near Sandy Hook. The *San Giovanni* established wireless communication with the station at Sea Gate and reported the accident. The United States Coast Guard cutter *Mohawk*, steamship *Portuguese Prince*, and steamship *Roma* went to assistance of distressed vessels.

May 19.—Steamship *Catania* went aground during heavy weather at Aransas Pass Bar, Tex. SOS signals promptly answered by radio station at Galveston, from which point a large tug was immediately dispatched to the distressed vessel. The tug succeeded in floating the *Catania* and towing her to Aransas docks. It is probable that without the prompt assistance secured by radio the vessel would have broken up, as a heavy gale was blowing.

May 29.—The bark *Jacquina*, when 51 days out of Alicante, Spain, found herself dangerously near rocks, entrance to harbor Guantanamo, Cuba. The steamship *An, tiles* discovered her plight and summoned a tug to her assistance by wireless.

June 14.—Steamship *Bear*, of the San Francisco & Portland Steamship Co., was wrecked off Cape Mendocino during the evening, the vessel grounding on a rock in a dense fog. The steamers *Queen*, *Grace Dollar*, U. S. S. *Oregon*, and the tug *Relief* responded to the distress calls sent. Five lives were lost as a result of capsizing of some of the lifeboats in the surf, while 200 passengers and crew were saved.

COAST SURVEY STEAMER MAKES RESCUE.

The Department has received a report of the rescue of the passengers and mail of the Spanish mail steamer *Fernando Po* by the Coast Survey steamer *Pathfinder*, on June 24 last, near Iloilo, P. I. The *Pathfinder* first picked up the SOS of the disabled steamer when about 180 miles distant, and immediately proceeded to the rescue, finding the *Fernando Po* stranded near Black Rock light, Tubbataha reef. After several futile attempts to float the steamer, the passengers and mail were taken off and carried to Iloilo, a distance of about 200 miles.

NAVAL COMMUNICATION SERVICE REGULATION.

The following announcement, which appeared in Radio Service Bulletin No. 19, of July 1, 1916, is being republished at the request of the Director of Naval Communications, particular attention being called to the fact that parentheses should be placed around "S C" in address of example shown. Failure of the sender of a radiogram to so inclose it may result in a charge being made for an additional word.

The Director of Naval Communications announces that, effective on and after July 1, 1916, it will be obligatory on the part of a sender of radiograms to be handled by the Naval Communication Service to indicate in the address of the message the class of vessel it is desired to reach by this service, such as "SS" (steamship or steamer) or "USS" (United States ship), as the case may be. Example:

[Radio.]

John Doe
USS New Hampshire
Charleston, (S C)

This order becomes necessary, owing to the confusion in proper handling of such traffic, inasmuch as a large number of names of ships are the same as those of cities, towns, etc.

The extra word will be charged for and counted in the check.

CHANGE IN TITLE OF NAVAL RADIO SERVICE.

Hereafter the Naval Radio Service will be known as the "Naval Communication Service." Charges on all traffic exchanged between other systems (radio, telegraph, and cable) and radio stations (ship and shore) operated by the Navy will be accounted for by the Naval Communication Service.

In addition to his other duties, the Director of Naval Communications will perform the duties formerly assigned to the Superintendent Naval Radio Service.

Correspondence relating to the Naval Communication Service should be addressed to the Director of Naval Communications, Radio, Va.

Remittances should be made payable to Naval Communication Service. If used, money orders should be drawn on postmaster, Washington, D. C.

MARCONI COMPANY INSURES ITS EMPLOYEES.

The Marconi Wireless Telegraph Co. of America has recently put into effect a system of life insurance for its operators and employees who have been in the Marconi service for more than one year, without expense to the holders of the policies. Accident insurance, valid for one year, has been furnished to such of the ship operators as are not eligible for regular life insurance under the conditions of the company's plan in order to give them protection until they become qualified for the life-insurance privilege. A suitable allowance will be made for personal effects lost by Marconi operators while on duty at sea in storms and wrecks. The company also will hold open the positions of its employees who wish to volunteer for service in the United States military forces, and can be spared, until January 1, 1917, allowing them half pay until that date, when the matter will receive further attention. The company has enrolled many of its rank and file as a naval reserve, having furnished the Navy Department with a complete list of its employees. The life-insurance announcement states:

Being constantly mindful of the loyalty and efficiency of our employees, and appreciating those qualities upon which the continued success of our company depends, and after a careful study of more than two years as to the best method of showing our appreciation, it has been decided to maintain for all employees without expense to them, insurance in the sum of \$500 for all those who have been with us over one year but less than five years, and in the sum of \$1,000 for all those who have been in the employ of the company five years or more.

In the announcement regarding accident insurance, E. J. Nally, vice president and general manager of the Marconi Co., said:

It gives me much pleasure to announce an extension of the company's insurance scheme which became effective April 1, 1916. As a further mark of appreciation for the work performed by our ship operators, the company desires to provide some protection for them until such time as they are eligible for regular life insurance, and it has therefore arranged to furnish without expense to ship operators not insured under the company's life plan a \$500 accident insurance policy.

The policy will be valid for one year and cover loss of life, both hands, both feet, one hand and one foot, or the sight of both eyes, by accident, in the amount of \$500.

Should the operator, upon passing into the life-insurance class, desire to continue the accident policy, arrangements have been made whereby he may do so at exceptionally low rates.

Employees of over one year's service, temporarily transferred to Government service under the call of the colors, will continue to be protected under the company's life-insurance plan, and such absence from duties will not interrupt the continuity of the employees' service and seniority benefits. Public spirit is also shown in the company's waiver of the usual fee charged students in its wireless school in New York, who will be instructed without cost.

AMENDMENTS.

[To be cut out and pasted in your copy.]

The Radio Laws and Regulations of the United States, edition of July 27, 1914, are hereby amended as follows:

Paragraph 73, page 57, amended September 1, 1916, to read:

Persons or corporations holding licenses for radio stations, either land or ship, should notify the radio inspector for the district whenever the station or vessel goes out of commission for a period exceeding three months. The Commissioner of Navigation should be notified promptly of any intention to suspend or discontinue the service of any commercial station.

Paragraph 74, page 57, amended September 1, 1916, to read:

If there is no intention to resume the same service, or if the station or vessel will enter a different service from that indicated by the license, the radio inspector will submit the license to the bureau, together with a statement of the facts, so that the license may be amended.

Paragraph 75, page 57, amended September 1, 1916, to read:

When the station goes into commission, the radio inspector will satisfy himself that the station corresponds to the schedule of the station as shown in the license.

Paragraph 93, page 59, amended September 1, 1916, to read:

Hereafter expired station licenses of all classes, commercial and amateur, need not be returned to the radio inspectors with applications for renewals. Owners desiring a renewal license must complete new forms, as prescribed for original applications. New licenses will be issued in every case of renewal.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, October 1, 1916—No. 22

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Chichagof, Alaska ¹	O 136 9 20 N 57 36 30	KWW	50	Composite.....	300, 550, 600
Independence, Kans. ²	O 95 44 00 N 37 14 00	WQL	150	Composite, 480.....	1700
Kensington, Alaska.....		KDN		Marconi.....	
Wells, Minn. ³	O 93 45 00 N 43 45 00	WPT	150	Marconi, 240.....	500
Wichita, Kans. ⁴	O 97 20 00 N 37 42 00	WQM	200	Composite, 480.....	1700

¹ Service, limited commercial; hours, X. Radio station operated and controlled by Joseph T. Bauer. The station is limited to communication with Sitka and Juneau, Alaska, and ships of the Alaska Steamship Co. and the Pacific Coast Steamship Co.

² Service, limited commercial; hours, X. Radio station operated and controlled by Kansas Gas & Electric Co. The station is limited to communication with Wichita and Pittsburg, Kans.

³ Service, limited commercial; hours, X. Radio station operated and controlled by Wells Flour Mill Co. The station is limited to communication with stations of the International Milling Co.

⁴ Service, limited commercial; hours, X. Radio station operated and controlled by Kansas Gas & Electric Co. The station is limited to communication with Independence and Pittsburg, Kans.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Admiral Goodrich ¹	WRJ	Kilbourne & Clark, 1,000....	300, 440, 520, 600	Pacific-Alaska Navigation Co.
Eureka.....	WAE	.....	300, 600	Alaska Steamship Co.
Henry R. Mallory ²	KFF	Marconi.....	300, 600	Mallory Steamship Co.
Kuskokwim River ³	WLK	Marconi, 1,000.....	300, 450, 600	Westward Nav. Co. (Inc.)
Luckenbach No. 1.....	KEO	Kilbourne & Clark.....	.....	Edgar F. Luckenbach
Maryland.....	KIN	Marconi.....	300, 600	Crew Levick & Co.
Santa Alicia ⁴	WSI	Marconi, 480.....	300, 600	W. R. Grace & Co.
Sunoll ⁴	KWP	Marconi.....	300, 600	Sun Co.

¹ Range, 200; service, PG; hours, N; rates, 4 c. per word, 40 c. minimum per radiogram. Radio station operated and controlled by Pacific-Alaska Navigation Co., owner of vessel.

² Service, PG.

³ Range, 150; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by Marconi Co.

⁴ Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by Marconi Co.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; c—land station.]

Call signal.	Name.	Call signal.	Name.
KDN	Kensington, Alaska.....	WLK	Kuskokwim River.....
KFF	Henry R. Mallory.....	WPT	Wells, Minn.....
KEO	Luckenbach No. 1.....	WQL	Independence, Kans.....
KIN	Maryland.....	WQM	Wichita, Kans.....
KWP	Sunoll.....	WRJ	Admiral Goodrich.....
KWW	Chichagof, Alaska.....	WSJ	Santa Alicia.....
WAE	Eureka.....		

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name =Name of station.
 G. loc =Geographical location: O=west longitude, N=north latitude.
 Call =Call letters assigned.
 System=Radio system used and sparks per second.
 Range =Normal range in nautical miles.
 W. L. =Wave lengths assigned: Normal wave lengths in *italics*.
 Service=Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P=Private.
 O=Government business exclusively.
 Hours =Hours of operation:
 N=Continuous service.
 X=No regular hours.
 m=a. m. (12m=midday).
 s =p. m. (12s=midnight).
 Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
 Notes =Refer to notes in the Berne list.

NOTICE.

It will be noted that the additions, alterations, and corrections contained in this Bulletin apply to the List of Radio Stations of the United States, edition of July 1, 1916, which is now in the hands of the printer, although it is not possible at this time to anticipate its delivery. All additions, alterations, and corrections appearing in this and later editions of the Bulletin should be saved and inserted in the new annual list as soon as it is received.

A sufficient number of blank pages will be inserted in the back of the new list in order that these particulars may be clipped and pasted therein, enabling radio operators and others concerned to keep their annual list up to date with very little trouble.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- DAVENPORT, IOWA.—Strike out all particulars.
 DOVER, N. J.—Strike out all particulars.
 MARSHFIELD, OREG.—Range, 150; hours, first and last 15 minutes of each hour from 8m. to 6s., time of the meridian 120° west of Greenwich.
 NEWPORT, R. I. (WCI).—System, Fessenden, 1,000.
 PORTLAND, OREG. (KGN).—System, composite, 450. Note, Station is restricted to communication with Underwood, Wash.
 PORT WALTER, ALASKA.—Service, PG; hours, X; rates, 8 c. per word 80 c. minimum per radiogram.
 RIALTO, CAL.—G. loc., O 117° 26' 53'', N. 34° 12' 08''.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Lerne bureau.]

- ALGONQUIN (KVG).**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- AROLINE.**—Strike out all particulars.
- ARTISAN.**—Strike out all particulars.
- BATON ROUGE.**—System, Marconi, 1,000; W. L., 300, 450, 600; hours, X. Note, Radio operated and controlled by the Marconi Co.
- BAYWAY.**—System, Marconi, 1,000; W. L., 300, 450, 600; hours, X. Note, Radio station operated and controlled by the Marconi Co.
- BRILLIANT.**—W. L., 300, 450, 600; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- BRUNSWICK.**—Range, 150; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CALIFORNIAN (WKC).**—System, Telefunken, 1,000; hours, X.
- CAMINO.**—System, Marconi, 400; hours, X.
- CITY OF DETROIT II.**—Hours, N.
- CITY OF EVERETT.**—Note, Standard Transportation Co., owner of vessel.
- CITY OF SYDNEY.**—Strike out all particulars.
- CITY OF TAUNTON.**—System, Fessenden, 260; W. L., 300, 550, 600.
- CLINCHER.**—Range, 100; W. L., 300, 450, 600.
- COMET (KTJ).**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Standard Transportation Co., owner of vessel.
- CORNING.**—W. L., 300, 450, 600.
- CRASTER HALL.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CUSHING (KSC).**—W. L., 300, 450, 600.
- DIANA.**—Range, 100; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
- D. G. SCOTFIELD.**—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600, 1800 service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co.
- DOCHRA.**—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X. Note, Radio station operated and controlled by the Marconi Co. Barber & Co. (Inc.), owner of vessel.
- EL SIGLO.**—System, Marconi, 1,000; W. L., 300, 450, 600; hours, N; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- ERSKINE M. PHELPS.**—Strike out all particulars.
- EXCELSIOR.**—W. L., 300, 450, 600.
- FRANCIS HANIFY.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- GETTYSBURG.**—Range, 100; system, Marconi, 480; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co.
- GULFCOAST.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- H. C. FOLGER.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co.
- HYADES.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600.
- J. B. STETSON.**—Strike out all particulars.

- J. W. VAN DYKE.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co.
- KANSAN.**—Hours, N.
- KOREA.**—Strike out all particulars.
- MAITLAND No. 1.**—Range, 100; system, Marconi, 480; hours, X.
- MOONLITE.**—Range, 100; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
- MOOREMACK.**—Range, 200; system, Marconi, 400; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co.
- MORENI.**—W. L., 300, 450, 600; hours, X. Note, Radio station operated and controlled by the Marconi Co.
- MOTANO.**—W. L., 300, 450, 600; hours, X. Note, Radio station operated and controlled by the Marconi Co.
- MOUNT HOPE.**—W. L., 300; service, P (emergency only).
- MUSKOGEE.**—W. L., 300, 450, 600.
- PANUCO.**—System, Marconi, 480; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PERFECTION.**—W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- RADIANT.**—W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- RIO GRANDE (KEG).**—Hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- ST. LOUIS (KSL).**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- SAN RAMON.**—Hours, X. Note, San Ramon Steamship Co., owner of vessel.
- SANTA ALICIA.**—Strike out all particulars.
- SEWARD.**—Rates, 4 c. per word 40 c. minimum per radiogram. Note, William C. Procter, owner of vessel.
- SOCONY.**—Note, Standard Transportation Co., owner of vessel.
- STARLITE.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
- SUCROSA.**—Range, 300; system, Marconi, 1,000; service, PG; hours, X.
- TASCO.**—W. L., 300, 600.
- TRINIDADIAN.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- VESTA (KTS).**—System, Marconi, 1,000; W. L., 300, 450, 600. Note, Standard Transportation Co., owner of vessel.
- VIGILANCIA.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Gaston, Williams & Wignmore, owners of vessel.
- VIRGINIA (KFR).**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
- WANA.**—Strike out all particulars.
- W. B. FLINT.**—Strike out all particulars.

MISCELLANEOUS.

COMMERCIAL RADIO OPERATORS LICENSED DURING MONTH OF AUGUST
1916.*First grade.*

Date.	Licensee.	Address.	Serial number.	Where issued.
7	Betts, Philander H.	238 Valley Rd., Montclair, N. J.	14683	Brooklyn. ²
4	Buckingham, Eldridge.	2760 Scott St., San Francisco, Cal.	12372	San Francisco. ¹
2	Burhop, Harold J.	Valparaiso, Ind.	13713	Chicago. ¹
19	Cockett, William.	666 56th St., Brooklyn, N. Y.	14689	Brooklyn. ²
9	Cooke, Robert L.	758 Kinan St., Honolulu, Hawaii.	13306	Honolulu. ²
2	Corey, Harry E.	Valparaiso, Ind.	13712	Chicago. ¹
14	Fish, Edward H.	27 Highland Ave., Middletown, N. Y.	14685	Brooklyn. ²
2	Fisher, Frank S.	6051 Woodlawn Ave., Chicago, Ill.	13711	Chicago. ¹
16	Flack, Henry.	830 Park Ave., Brooklyn, N. Y.	14688	Brooklyn. ²
16	Gittleston, Mitchell.	912 E. 180th St., New York, N. Y.	14686	Brooklyn. ²
31	Harris, Charles C.	Freeport, N. Y.	14075	New York. ¹
23	Hatch, William B.	16 Cherry St., Collingdale, Pa.	13103	Mare Island. ²
17	Hyams, Jack.	1191 S. Spring St., Los Angeles, Cal.	12377	San Francisco. ¹
24	Johnston, James E.	1379 Clay Ave., New York, N. Y.	14690	Brooklyn. ²
4	Kendall, Lewis F., Jr.	Millville, N. J.	14682	Brooklyn. ²
4	Kilton, James A., Jr.	21 Lasell St., Auburndale, Mass.	14260	Boston. ¹
3	Larson, Louis J.	971 Mission St., San Francisco, Cal.	12371	San Francisco. ¹
28	Marshall, Floyd W.	8 Avery Terrace, Detroit, Mich.	13717	Chicago. ¹
31	Moore, Daniel D.	2308 N. Charles St., Baltimore, Md.	14262	Boston. ¹
22	Norris, George H.	77 Melbourne Ave., Detroit, Mich.	13716	Detroit. ¹
9	O'Day, Howard H.	1706 Warwick Ave., Baltimore, Md.	12178	Baltimore. ¹
12	Phillips, Warren, Jr.	600 N. Olympia St., New Orleans, La.	12298	New Orleans. ¹
22	Platt, Paul T.	1-2 Sycamore St., Winter Hill, Mass.	14261	Boston. ¹
17	Roberts, Walter C.	U. S. Naval Radio Station, Yerba Buena, Cal.	12379	San Francisco. ¹
2	Russell, Stanley R.	218 Willow Ave., Somerville, Mass.	12911	Philadelphia. ²
25	Schmeling, Gustav J.	300 Lake Ave., Seattle, Wash.	14120	Seattle. ¹
29	Setzen, Harry T.	Fort Mason, Cal.	12380	San Francisco. ¹
16	Shebat, Herbert V.	2825 Hennepin Ave., Minneapolis, Minn.	14687	Brooklyn. ²
16	Shields, William L.	U. S. S. Ajax, care postmaster, San Francisco, Cal.	12179	Baltimore. ¹
15	Spenser, Edward R.	1640 23d Ave., Oakland, Cal.	12376	San Francisco. ¹
11	Stevenson, William H.	733 Fillmore St., San Francisco, Cal.	12374	San Francisco. ¹
4	Taylor, Francis J.	U. S. S. Androscoggin, care postmaster, Boston, Mass.	14259	Boston. ¹
31	Van Scherpenreil, G. H.	Rotterdam, Holland.	14076	New York. ¹
29	Werlein, Edwin.	4060 Lincoln Ave., Chicago, Ill.	13718	Chicago. ¹
17	Westcott, Laurence M.	U. S. Naval Radio Station, Yerba Buena, Cal.	12378	San Francisco. ¹
26	Wiehr, Jack A.	S. S. Admiral Schley, Seattle, Wash.	14125	Seattle. ¹
15	Wisner, Fred L.	1346 30th St., San Diego, Cal.	12375	San Francisco. ¹
22	Young, David H.	850 Oak St., Columbus, Ohio.	13715	Detroit. ¹
11	Zelevovitch, Emanuel.	705 Jackson St., Oakland, Cal.	12373	San Francisco. ¹

Second grade.

2	Antry, James L., Jr.	5 Courtlandt Pl., Houston, Tex.	12385	Chicago. ¹
17	Bennett, Herlert P.	4202 N. Winchester Ave., Chicago, Ill.	12337	Chicago. ¹
11	Bradshaw, Clyde B.	57 Billings Rd., Quincy, Mass.	12065	Boston. ¹
2	Church, Arthur B.	Lamoni, Iowa.	13714	Chicago. ¹
10	Collins, Frank J.	22 Cedar St., Yonkers, N. Y.	13821	Brooklyn. ²
10	Earle, Robert E.	Elgin, Iowa.	12336	Chicago. ¹
18	Marsh, Albert A.	11 Heard St., Chelsea, Mass.	12066	Boston. ¹
8	Noyes, William A., Jr.	1005 Nevada St., Urbana, Ill.	13820	Brooklyn. ²
2	Rhoads, George L.	St. Albans, W. Va.	12384	Chicago. ¹
2	White, Donald G.	Valparaiso, Ind.	12383	Chicago. ¹

¹ Issued by radio inspector, Department of Commerce.² Issued by radio examining officer, Navy Department.

ALASKAN NAVAL RATES.

The Director of Naval Communications announces that, effective on and after October 1, 1916, the following rates, to conform as near as possible to the Washington-Alaska Military Cable and Telegraph system rates effective that date, will be placed in effect via the Naval Communication Service in Alaska. These rates will supersede all other rates in effect over this system. Full instructions will be issued by this office through amendments to the commercial traffic regulations.

SHIP-TO-SHORE SERVICE.

All traffic to or from ships at sea will be prefixed "Radio." Cable count will be used. Ten-word minimum will be required.

Naval radio stations at St. Paul, St. George, Dutch Harbor, Kodiak, Cordova, and Sitka will apply a 6-cent coast tax.

Service between any point in Alaska reached by the Naval Communication Service or the Washington-Alaska Military Cable and Telegraph system and any of these stations will carry a rate of 5 cents per word additional. This will also include North Head or Seattle for local delivery or for transfer to other systems to reach points beyond these systems. The traffic may be routed via either the Naval Communication Service or cable service or both. This rate does not include other line charges. Same should be added if it is necessary to employ other lines to reach destination. All commercial traffic for California should be forwarded to North Head and there placed on the wire instead of relaying to Eureka.

POINT-TO-POINT SERVICE.

The following rates will apply. Domestic count with 10-word minimum will be used (address and signature not counted). Both night service and night-letter service will be accepted. Collect replies will be accepted in either direction. No other collect traffic will be accepted. Prefix "Radio" will not be used.

	Day rate.	Night rate.
	Cents.	Cents.
North Head to Sitka (radio or cable).....	10	8
North Head to Cordova (radio or cable).....	15	11
North Head to Dutch Harbor, St. Paul, St. George, Kodiak.....	19	14
Sitka to Cordova (radio or cable).....	10	8
Cordova (radio or cable office) to St. Paul, St. George, Dutch Harbor, Kodiak.....	4	3
Dutch Harbor to St. Paul, St. George, Kodiak, Cordova (radio or cable office).....	4	3
St. Paul to St. George, Kodiak, Dutch Harbor, Cordova (radio or cable office).....	4	3
Kodiak to St. Paul, St. George, Dutch Harbor, Cordova (radio or cable office).....	4	3
Sitka to St. Paul, St. George, Dutch Harbor, Kodiak.....	9	7
St. Paul to Nome (includes Nome station charge).....	10	8

Two-cent loop charge (25 cents minimum charge per message) between Cordova radio and Cordova cable, also between Sitka radio and Sitka cable, will apply on local traffic only between such points.

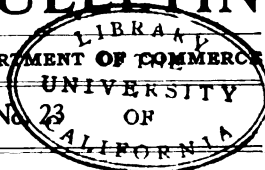
Other radio stations in Alaska desiring to exchange traffic with the Naval Communication Service must communicate with the nearest naval radio station. Navy station receiving charge of 6 cents per word (10-word minimum) will apply. Add charges beyond.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, November 1, 1916—No. 23



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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

Station.	Call signal.	System.	Wave lengths.	Service.	Hours.
Fire Island Lightship No. 68. ¹	NLS	U. S. Navy.....	.....	O.....	X.
Fort Yukon, Alaska. ²	WXX	U. S. Army.....	1, 100	PR.....	8m-6s.
Holy Cross, Alaska. ²	WVK	U. S. Army, 1,000.	.....	PG.....	10m-3s.
Lewiston, Mont. ³	KLP	Marconi, 600.....	300, 600, 1,600	Limited commercial.	X.

¹ Radio station operated and controlled by the United States Naval Communication Service, Radio, Va.

² Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

³ Range, 150. Radio station operated and controlled by the Montana Power Co.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Service.	Hours.
Amolco.....	KMB	Wireless Specialty Apparatus Co.	.....	.....	.....
Cauto. ¹	KWF	Marconi.....	300, 600	PG	N
Idaho. ²	WOO	Marconi, 1,000.....	300, 450, 800.	PG	N
Joseph R. Parrott. ³	KJP	Marconi.....	300, 600	.....	.....
Luckenbach No. 2.....	KGC	.....	.....	.....	.....
Luckenbach No. 3.....	KGF	.....	.....	.....	.....
Luckenbach No. 4.....	KGG	Kilbourne & Clark.....	.....	.....	.....
Oregon. ⁴	WOC	Marconi, 1,000.....	300, 450, 800.	PG	N
Panuco. ⁵	KWM	Marconi.....	300, 600	PG	N
Paulsboro. ⁶	KRS	Marconi, 1,000.....	300, 450, 800.	PG	X
P. S. No. 6. ⁷	IYP	Cutting & Washington, 1,000.....	200, 300, 800.	P	X
William Rockefeller. ⁸	KWO	Marconi.....	300, 600	.....	.....
Wilmore. ⁹	KIK	Marconi, 480.....	300, 600	PG	X

¹ Rates, North and South American service, 4 cents per word, 40 cents minimum per radiogram; trans-oceanic service, 8 cents per word, 80 cents minimum per radiogram. Radio station operated and controlled by the Marconi Co. New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.

² Rates, North and South American service, 4 cents per word, 40 cents minimum per radiogram; trans-oceanic service, 8 cents per word, 80 cents minimum per radiogram. Radio station operated and controlled by the Marconi Co. Wilson Bros. & Co., owner of vessel.

³ Rates, North and South American service, 4 cents per word, 40 cents minimum per radiogram; trans-oceanic service, 8 cents per word, 80 cents minimum per radiogram. Radio station operated and controlled by the Marconi Co. Florida East Coast Railway Co., owner of vessel.

⁴ Range, 300. Rates, North and South American service, 4 cents per word, 40 cents minimum per radiogram; trans-oceanic service, 8 cents per word, 80 cents minimum per radiogram. Radio station operated and controlled by the Marconi Co. Vacuum Oil Co., owner of vessel.

⁵ Range, 100. Radio station operated and controlled by the owner of vessel, Hermann Oelrichs.

⁶ Rates, North and South American service, 4 cents per word, 40 cents minimum per radiogram; trans-oceanic service, 8 cents per word, 80 cents minimum per radiogram. Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

⁷ Rates, North and South American service, 4 cents per word, 40 cents minimum per radiogram; trans-oceanic service, 8 cents per word, 80 cents minimum per radiogram. Radio station operated and controlled by the Marconi Co. Wilmore Steamship Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
IYP	P. S. No. 6.....	KWF	Cauto.....
KGC	Luckenbach No. 2.....	KWM	Panuco.....
KGF	Luckenbach No. 3.....	KWO	William Rockefeller.....
KGG	Luckenbach No. 4.....	NLS	Fire Island Lightship.....
KIK	Wilmore.....	WOC	Oregon.....
KJP	Joseph R. Parrott.....	WOO	Idaho.....
KLP	Lewiston, Mont.....	WVK	Holy Cross, Alaska.....
KMB	Amolco.....	WXX	Fort Yukon, Alaska.....
KRS	Paulsboro.....		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Albany, N. Y.	2XK	Variable to 300....	P	X	New York State College for Teachers.
Bozeman, Mont.	7XB	300, 600.....	P	X	Montana State College.
Brookville, Pa.	8YW	200, 450.....	P	X	Clarence M. Wickes.
Clayton, Cal.	6XG	Variable.....	P	X	National Radio Co.
Fresno, Cal.	6ZF	200, 425.....	P	X	Oliver M. Howard.
Keddle, Cal.	6XU	Variable.....	P	X	National Radio Co.
Las Plumas, Cal.	6XK	do.....	P	X	Do.
Toledo, Ohio.	8ZL	200, 425.....	P	X	Willis K. Wing (Scott High School).
Williamsport, Pa.	8XX	200, 700.....	P	X	Earl R. Thomas.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
2XK	Second district: Albany, N. Y.	7XB	Seventh district: Bozeman, Mont.
6XG	Sixth district: Clayton, Cal.	8XX	Eighth district: Williamsport, Pa.
6XK	Las Plumas, Cal.	8YW	Brookville, Pa.
6XU	Keddle, Cal.	8ZL	Toledo, Ohio.
6ZF	Fresno, Cal.		

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc =Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in *italics*.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P=Private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

NOTICE.

It will be noted that the additions, alterations, and corrections contained in this Bulletin apply to the List of Radio Stations of the United States, edition of July 1, 1916, which is now in the hands of the printer,

although it is not possible at this time to anticipate its delivery. All additions, alterations, and corrections appearing in this and later editions of the Bulletin should be saved and inserted in the new annual list as soon as it is received.

A sufficient number of blank pages will be inserted in the back of the new list in order that these particulars may be clipped and pasted therein, enabling radio operators and others concerned to keep their annual list up to date with very little trouble.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

BROOKS, ALASKA.—Service, PR; hours, 9.30m to 10m, 1s to 1.30s, 4s to 4.30s; rate, 20 c. per word, \$2 minimum per radiogram. Notes, Radio station operated and controlled by the Alaska Wireless Telegraph Co. The station communicates only with the station of the United States Signal Corps, Fairbanks, Alaska.

FORT MORGAN, ALA. (WFM).—W. L., 300, 435, 600; service, PG and PR; hours, for PG service, sixth 5 minutes of each hour from 6m to 6s; for PR service, first 25 minutes of each hour from 6m to 6s.

IDITAROD, ALASKA.—System, Telefunken, 1,000; W. L., 500, 1650; service, PR; rates, to Nulato or Holy Cross, Alaska, 25 c. per word, \$2.50 minimum per radiogram, domestic count. Night letters to Nulato or Holy Cross, Alaska, \$2.50 for 50 words, 25 c. for each additional 10 words or fraction thereof, domestic count. Notes, Radio station operated and controlled by the Alaska Wireless Telegraph Co. The station is limited to communication with the United States Signal Corps stations at Nulato and Holy Cross, Alaska.

JUNEAU, ALASKA.—W. L., 300, 600, 3000; service, PG and PR; hours, 8m to midnight; rates, for general public service, North and South American service, 6 c. per word, 60 c. minimum per radiogram, transoceanic service, 12 c. per word, \$1.20 minimum per radiogram, for limited public service, as follows:

Messages.	To Seattle, Wash., or Astoria, Oreg.	To Ketchikan, Alaska.	To Jualin, Alaska.
Day messages:			
Per word	\$0.10	\$0.04	\$0.06
Minimum per radiogram	1.00	.40	.60
Night messages:			
Per word	.08	.....	.....
Minimum per radiogram	.80	.....	.....
Night letters:			
Per 10 words	.20	.08	.12
Minimum per radiogram of 50 words	1.00	.40	.60

NOTE.—All of the above are domestic count.

LATOCHE, ALASKA.—W. L., 300, 600, 1650; service, PG and PR; hours, 1s to 5s. Notes, Radio station operated and controlled by the Kennecott Copper Corporation. The station also communicates with land stations at Cordova, Kodiak, and Sitka, Alaska. Rates, day messages, 6 c. per word, 60 c. minimum per radiogram, cable count; night messages, 75 per cent of day rate, domestic count; night letters, 60 c. for 50 words, 12 c. for each additional 10 words or fraction thereof, domestic count.

MILWAUKEE, WIS.—Hours, 8m–12m, 1s–5m, 6s–5m.

MOBILE, ALA.—W. L., 300, 535, 600; hours, PG service, last 35 minutes of each hour from 6m to 6s and continuous from 6s to 8.30s, PR service, first 25 minutes of each hour from 6m to 6s.

NEW ORLEANS, LA. (WNU).—W. L., 300, 600, 2200; rates, PG with ships, 12 c. per word, \$1.20 minimum per radiogram, PR rates, as follows, per word, cable count, no minimum:

	Cents.
All points in British Honduras.....	17½
Bluefields, Nicaragua.....	22½
Bocas del Toro, Panama.....	27½
Burwood, La.....	5
All points in Costa Rica.....	25
Swan Island.....	12½

PORT WALTER, ALASKA.—W. L., 300, 525, 600, 1625; service, PG and PR; rates, PG service, 6 c. per word, 60 c. minimum per radiogram, PR service with Juneau, Ketchikan, Wrangell, and Sitka, Alaska, day messages, 6 c. per word, 60 c. minimum per radiogram, cable count; night messages, 75 per cent of day rate, domestic count; night letters, 60 c. for 50 words, 12 c. for each additional 10 words or fraction thereof, domestic count.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ARBOREAN.—Strike out all particulars.

ASTRAL.—Range, 150; system, Marconi, 1000; hours, X.

ATLANTIC.—Strike out all particulars.

BAY STATE.—Strike out all particulars.

CACIQUE.—System, Federal Poulsen arc; W. L., 300, 600, 1800; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Radio station operated and controlled by the Federal Telegraph Co. W. R. Grace & Co., owner of vessel.

CLINCHER.—Strike out all particulars.

CONGRESS.—Strike out all particulars.

COSTA RICA.—System, Halcun, 400; hours, X.

DAYTON.—W. L., 300, 450, 600.

EURANA.—Notes, Radio station operated and controlled by the Marconi Co. Southland Steamship Co., owner of vessel.

F-4.—Strike out all particulars.

GEORGE E. PADDLEFORD.—Notes, Radio station operated and controlled by the Marconi Co. Pan American Petroleum & Transport Co., owner of vessel.

GEO. W. ELDER.—Range, 150.

GEORGIAN.—Strike out all particulars.

HARSTEELE.—Range, 100; system, composite, 240; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Steele Towing & Wrecking Co., owner of vessel.

HEALDTON.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

HENRY R. MALLORY.—Range, 250; system, Marconi, 1,000; W. L., 300, 450, 600; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Co. Mallory Steamship Co., owner of vessel.

HIRAM B. EVEREST.—Strike out all particulars.

HONOLULAN.—Strike out all particulars.

I. D. FLETCHER.—Hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

J. M. DANZIGER.—Notes, Radio station operated and controlled by the Marconi Co. Pan American Petroleum & Transport Co., owner of vessel.

JUNEAU.—W. L., 300, 550, 600.

JUNIATA.—Notes, radio station operated and controlled by the Marconi Co. Great Lakes Transit Corporation, owner of vessel.

MARYLAND.—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

MAVERICK.—Strike out all particulars.

MEMPHIS.—Strike out all particulars.

MINNESOTA (WMI).—Range, 150; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

OCTORARA.—Notes, Radio station operated and controlled by the Marconi Co. Great Lakes Transit Corporation, owner of vessel.

PRINCETON (KST).—W. L., 300, 450, 600; hours, X.

REPUBLIC.—Notes, Radio station operated and controlled by the Marconi Co. Braden Copper Co., owner of vessel.

SANTA RITA (WMC).—Call, WBR.

SOMERSET (KSU).—W. L., 300, 450, 600; hours, X.

SUNOIL.—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.

VIGILANT.—Range, 100; system, Marconi, 240; hours, X. Radio station operated and controlled by the Marconi Co. Bay Steamship Co. of America (Ltd.), owner of vessel.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

OIL CITY, PA.—Strike out all particulars.

RICHMOND, VA.—Strike out all particulars.

SAN DIEGO, CAL.—Strike out all particulars.

TIFFIN, OHIO.—Strike out all particulars.

MISCELLANEOUS.

COMMERCIAL RADIO OPERATORS LICENSED DURING MONTH OF SEPTEMBER, 1916.

Extra first grade.

Date.	Licensee.	Address.	Serial No.	Where issued.
15	Fish, Arthur S.....	4 Burton Ave., Roxbury, Mass.....	51	New Orleans. ¹
28	Swanson, John W.....	746 Columbus Ave., New York, N. Y.....	53	Washington. ¹
19	Worrall, Joseph A.....	163 Logan St., Brooklyn, N. Y.....	52	Washington. ¹

First grade.

2	Adickes, Ernest D.....	173 W. Ridgewood Ave., Ridgewood, N. J.	14692	Brooklyn. ²
11	Bootes, Eugene H.....	Belleville, N. J.	14077	New York. ¹
4	Bremer, Edmund H.....	306 6th Ave., S. Seattle, Wash.....	13719	Chicago. ¹
29	Burns, Walter L.....	2320 Leavenworth St., San Francisco, Cal.	12390	San Francisco. ¹
14	Case, Harlow M.....	Benzonia, Mich.	13722	Frankfort, Mich. ¹
6	Christenson, Oscar.....	306 6th Ave., S. Seattle, Wash.....	14126	Seattle. ¹
25	Coblentz, Philip O.....	Middletown, Md.	12182	Baltimore. ¹
29	Conway, Horace B.....	52 S. Beach St., Rockaway Pk., N. Y.	14903	Brooklyn. ²
12	Cosby, Mark B.....	356 S. Hobart Ave., Los Angeles, Cal.	12383	San Francisco. ¹
21	Eckstein, William J.....	35 W. 177th St., New York, N. Y.	14698	Brooklyn. ²
19	Evans, Clarence.....	94 Union Ave., Nutley, N. J.	14901	Brooklyn. ²
25	Farmer, E. S.....	208 W. 69th St., New York, N. Y.	14700	Brooklyn. ²
19	Ferguson, Earl.....	1723 Melrose Ave., Seattle, Wash.	14131	Seattle. ¹
22	Ferris, Willard.....	401 Lincoln Ave., Valparaiso, Ind.	13725	Chicago. ¹
19	Gibson, Walter L.....	2324 Dennison St., Oakland, Cal.	12386	San Francisco. ¹

¹ License issued by radio inspector, Department of Commerce.

² License issued by radio examining officer, Navy Department.

**COMMERCIAL RADIO OPERATORS LICENSED DURING MONTH OF
SEPTEMBER, 1916—continued.**

First grade—Continued.

Date.	Licensee.	Address.	Serial No.	Where issued.
8	Griffin, William C.....	Foot of W. 60th St., Seattle, Wash....	14122	Seattle. ¹
25	Hayes, Frank X. J.....	162 E. 82d St., New York, N. Y.....	14699	Brooklyn. ²
27	Hidalgo, Stephen.....	153 E. 86th St., New York, N. Y.....	14082	New York. ¹
6	Hineline, William M.....	Port Moller, Alaska.....	14123	Seattle. ¹
14	Hoernel, Paul C.....	Babylon, L. I., N. Y.....	14695	Brooklyn. ²
13	Isaacson, Charles B.....	48 W. 89th St., New York, N. Y.....	14691	Brooklyn. ²
16	Johannessen, George J.....	1712 46th St. SW., Seattle, Wash....	14130	Seattle. ¹
1	Johnson, Aubrey N.....	2908 West Ave., Newport News, Va.....	13589	Fort Monroe, Va. ³
18	Keeler, Fayette W.....	634 W. Fourth St., Superior, Wis.....	13723	Duluth. ¹
27	Koechel, Walter P.....	Teaneck, N. J.....	14081	New York. ¹
5	Kottler, Carl F.....	1035 Second St., Milwaukee, Wis.....	13720	Chicago. ¹
1	Krone, Julian E.....	2908 West Ave., Newport News, Va.....	13590	Fort Monroe, Va. ³
1	Lacock, Thomas J.....	3 Danes Drive, Glasgow, Scotland.....	12381	San Francisco. ¹
8	Landsburg, Robert A.....	2909 Washington St., Seattle, Wash....	14127	Seattle. ¹
22	Lewis, Dean A.....	30 Williams St., Northampton, Mass.....	14265	Boston. ¹
5	MacMullen, Gerald F.....	1425 Le Conte Ave., Berkeley, Cal.....	13271	San Francisco. ¹
28	Maynes, Walter W.....	2903 Bonita Ave., Berkeley, Cal.....	12389	San Francisco. ¹
22	Neel, William G.....	155 Locust St., Valparaiso, Ind.....	13724	Chicago. ¹
12	Neuenburg, Henry C.....	233 10th Ave., San Francisco, Cal.....	12384	San Francisco. ¹
16	Nevin, William B.....	813 Victoria St., Victoria, B. C.....	14129	Seattle. ¹
2	O'Brien, Arthur.....	U. S. S. Preston.....	13404	San Juan, P. R. ³
13	Oschmann, George J.....	1093 Union Ave., New York, N. Y.....	14078	New York. ¹
26	Powell, Aaron L.....	4921 Magazine St., New Orleans, La.....	12299	New Orleans. ¹
19	Prioner, Anthony B.....	179 Tremont St., Newton, Mass.....	12635	Boston. ¹
12	Rackov, Maurice.....	35 Buena Vista Ter., San Francisco, Cal.....	12382	San Francisco. ¹
5	Reichert, Karl.....	P. O. Box 295, Marblehead, Mass.....	14264	Boston. ¹
27	Ryan, Francis L.....	1034 Bedford Ave., Brooklyn, N. Y.....	14902	Brooklyn. ²
16	Sanchez, Manuel.....	416 W. 23d St., New York, N. Y.....	14697	New York. ¹
15	Sandbach, Charles.....	2743 Kingsbridge Ter., New York, N. Y.....	14079	New York. ¹
11	Smith, Owen.....	47 Catherine St., Valley Stream, N. Y.....	14694	Brooklyn. ²
14	Stelzer, James G.....	Frankfort, Mich.....	13721	Frankfort. ¹
12	Sterrick, Harry L.....	1168 Clay St., San Francisco, Cal.....	12385	San Francisco. ¹
5	Whitcomb, Raymond E.....	U. S. S. Acushnet, Woods Hole, Mass.....	14263	Boston. ¹
23	Wunderlich, George.....	1736 Boren Ave., Seattle, Wash.....	14132	Seattle. ¹

Second grade.

9	Bowman, Christopher M.....	150 E. Chestnut St., Lancaster, Pa.....	12477	Philadelphia. ²
18	Brasher, Lloyd.....	1666 N. White St., New Orleans, La.....	12207	New Orleans. ¹
9	Egner, John.....	3126 N. 7th St., Philadelphia, Pa.....	12475	Philadelphia. ²
9	Faries, Walter.....	Bala, Pa.....	12476	Philadelphia. ²
6	Graf, Adolph A.....	1061 Mulberry St., Rockford, Ill.....	12358	Chicago. ¹
19	King, George J.....	835 Exposition Blvd., New Orleans, La.....	12208	New Orleans. ¹
22	Lynn, Harold W.....	107 Alden St., Whitman, Mass.....	12069	Boston. ¹
1	Mason, Howard F.....	2702 31st Ave., S., Seattle, Wash.....	12274	Seattle. ¹
1	Nickerson, Edgar W.....	16 Atlantic Ave., Beverly, Mass.....	12067	Boston. ¹
14	Pope, George W.....	761 Manhattan Ave., Brooklyn, N. Y.....	13822	Brooklyn. ²
22	Smith, Carlos M.....	Lamoni, Iowa.....	12340	Chicago. ¹
22	Winds, Guldford R.....	873 Spruce St., Winnetka, Ill.....	12359	Chicago. ¹
12	Woodhead, Edward F.....	56 Summer St., Lewiston, Me.....	12068	Boston. ¹

¹ License issued by radio inspector, Department of Commerce.
² License issued by radio examining officer, Navy Department.
³ License issued by radio examining officer, War Department.

RADIO STATIONS OF THE UNITED STATES.

[Edition of July 1, 1916.]

Government, commercial, and special land stations.

Controlled by—	General public.		Limited public.		Limited commercial.		Special.		Government official.		Total.	
	1915	1916	1915	1916	1915	1916	1915	1916	1915	1916	1915	1916
United States Navy.....	21	24	1	1	.....	.....	.....	.....	33	32	55	57
United States Army.....	9	9	.....	.....	.....	.....	.....	.....	39	45	48	54
Philippine insular government.....	6	6	.....	.....	.....	.....	.....	.....	.....	.....	6	6
Marconi Co.....	45	44	4	6	10	9	1	1	.....	.....	60	60
National Electric Signaling Co.....	2	2	1	1	1	1	.....	.....	.....	.....	4	4
Tropical Radio Telegraph Co.....	2	2	.....	1	.....	1	.....	1	.....	.....	2	5
Federal Telegraph Co.....	3	5	4	5	1	2	.....	.....	.....	.....	8	12
Mutual Telephone Co.....	3	1	.....	2	2	3	.....	.....	.....	.....	5	6
Unclassified.....	7	10	3	2	32	39	127	193	2	4	171	248
Total.....	98	103	13	18	46	55	128	195	74	81	359	452

Ship stations.

Controlled by—	Number.		Controlled by—	Number.	
	1915	1916		1915	1916
United States Navy.....	228	233	Alaska Steamship Co.....	12	12
United States Coast Guard.....	24	25	Standard Oil Co.....	11	10
United States Army.....	51	50	Panama Railroad Co.....	.....	5
United States Department of Commerce.....	7	8	Pacific-Alaska Navigation Co.....	5	5
Marconi Co.....	367	414	Federal Telegraph Co.....	5	17
National Electric Signaling Co.....	20	20	Atlantic Communication Co.....	2	5
Tropical Radio Telegraph Co.....	21	21	Unclassified.....	120	70
American-Hawaiian Steamship Co.....	21	19	Total.....	305	200

Amateur stations.

District and headquarters.	Number.		District and headquarters.	Number.	
	1915	1916		1915	1916
1. Boston, Mass.....	542	832	7. Seattle, Wash.....	203	215
2. New York, N. Y.....	636	840	8. Detroit, Mich.....	785	945
3. Baltimore, Md.....	682	821	9. Chicago, Ill.....	515	700
4. Savannah, Ga.....	54	103	Total.....	3,836	5,255
5. New Orleans, La.....	56	116			
6. San Francisco, Cal.....	363	614			

RADIO STATIONS OF THE UNITED STATES—continued.

Summary.

Kind of station.	1915	1916	Kind of station.	1915	1916
Government land stations.....	109	117	Other land and ship stations, except general and restricted amateur land stations.....	834	939
Other land stations, except gen- eral and restricted amateur.....	249	335	Total.....	1,253	1,372
Total.....	358	452	General and restricted amateur stations.....	3,836	5,255
Government ship stations.....	310	316	Grand total.....	5,089	6,627
Other ship stations.....	585	604			
Total.....	895	920			
Government land and ship sta- tions.....	419	433			

RECENTLY ORGANIZED RADIO CLUB.

Extracts from the Yearbook of the San Francisco Radio Club.

OBJECT AND PURPOSE.

During the early part of January, 1916, a number of prominent commercial and experiment radio operators of San Francisco met in order to discuss the possibility of organizing a radio club in that city. The number of enthusiastic operators barely reached the dozen mark, but regardless of the small number present, a prosperous future for a radio organization was foreseen, and the necessary steps toward founding an organization were taken. Radio operators throughout the city were notified of the undertaking and were urged to give all possible support to insure a huge success.

A meeting was held and the number of responders was surprisingly large. A constitution was framed, submitted for approval at a later date, and finally signed by 15 charter members. The situation was then well in hand, and the membership of the club increased rapidly as the weeks passed by, until at the present time 36 radio men are in possession of the membership card.

MEMBERSHIP AND QUALIFICATIONS.

The membership comprises:

(a) Members who either hold a first-grade commercial license or better or who have passed the club examination of that grade.

(b) Associates who are interested in radio communication.

Associate members desiring to become full members are examined when their capability permits, and if they are successful in passing the club examination they are transferred from the grade of associate to member. A certificate of skill will be issued to all associates who successfully pass the examination.

MEETINGS.

Meetings of the San Francisco Radio Club are held every Friday evening at the club room, 737 Shrader Street, at 8 o'clock.

The four meetings per month comprise an experiment meeting, a social meeting, and two business meetings. At the experiment meeting various electrical and radio apparatus are demonstrated. Experiments impossible for a single experimenter to perform have been made possible by the cooperation of the members.

ADVANTAGES OF MEMBERSHIP.

The San Francisco Radio Club offers many distinct advantages to its members. Radio men in all grades of experience come together, exchange ideas, relate experiences, benefit by interesting and educational lectures, and learn the methods of good speech delivery. Commercial operators come into contact with amateur operators and experimenters; interference between stations is reduced to a minimum, and the maximum of efficiency is secured from the experimenters' apparatus with the aid

of accurately calibrated measuring instruments which the club possesses. Privately owned stations are tuned to resonance to comply with the regulations of the Department of Commerce without charge to the owner.

NEW WIRELESS STATION ON AFRICAN COAST.

Military engineers are erecting a wireless station on Cape Juby, on the African coast, and expect to have it in operation before October 1. In cases of need at sea the service will be available for ships in distress. As the big installation on Teneriffe Island is less than 100 miles from the Cape Juby plant, communication with the Canary Islands will be possible and, through them, with the Spanish mainland.

A regular steamship service to Cape Juby, with sailings from Santa Cruz de Teneriffe on the 28th of each month, has been announced in the newspapers.

ALASKAN RADIO STATIONS CLOSED.

The bureau has been informed that the following land stations in Alaska have been closed for the season, and will not be reopened until March, 1917: Akutan (KNW), Chignik (KHC), Egegak (KMF), Hales Creek (KMT), Koggiung (KVV), Koggiung (KHB), Naknek (KHT), Naknek (KMK), Nushagak (KMG), and Snag Point (KHF).

TWO NEW WIRELESS STATIONS FOR COLOMBIA.

It is reported that the two Marconi outfits purchased by the Colombian Government some time ago will be delivered soon. It is intended to establish these two stations at Arauca and Orocué. The former is situated on the Arauca River where it forms the boundary between Colombia and Venezuela, and the latter is on the Meta River some 200 miles east of Bogota.

ADDITIONAL COPIES

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, December 1, 1916—No. 24

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation

Approved:
E. F. SWEET,
Acting Secretary.

NEW STATIONS.

SHIP STATIONS; ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Service.	Hours.
A-2 *.	NXB	U. S. Navy.	300, 600.	PG	N
A-3 *.	NXC	do.	300, 600.	PG	N
A-4 *.	NXD	do.	300, 600.	PG	N
A-5 *.	NXE	do.	300, 600.	PG	N
A-6 *.	NXF	do.	300, 600.	PG	N
A-7 *.	NXG	do.	300, 600.	PG	N
Accomac *.	NTH	do.	300, 600.	PG	N
Active *.	NTJ	do.	300, 600.	PG	N
Aileen *.	NVO	do.	300, 600.	PG	N
Alice *.	NTM	do.	300, 600.	PG	N
Apache *.	NTN	do.	300, 600.	PG	N
Arapahoe *.	NSP	do.	300, 600.	PG	N
B-1 *.	NXH	do.	300, 600.	PG	N
B-2 *.	NXI	do.	300, 600.	PG	N
B-3 *.	NXJ	do.	300, 600.	PG	N
Bagley *.	NVU	do.	300, 600.	PG	N
Barney *.	NVV	do.	300, 600.	PG	N
Benjamin Brewster ¹ .	KPS	Marconi.	300, 600.	PG	N
Biddle *.	NVW	U. S. Navy.	300, 600.	PG	N
Boston *.	NGC	do.	300, 600.	PG	N
Boxer *.	NSY	do.	300, 600.	PG	N
Britannia ² .	KXS	Marconi, 1,000.	300, 450, 600.	PG	X
Brynhilda ³ .	KIO	Marconi.	300, 600.	PG	N
C-1 *.	NXK	U. S. Navy.	300, 600.	PG	N
C-2 *.	NXL	do.	300, 600.	PG	N
C-3 *.	NXM	do.	300, 600.	PG	N
C-4 *.	NXN	do.	300, 600.	PG	N
C-5 *.	NXO	do.	300, 600.	PG	N
Callao *.	NQG	do.	300, 600.	PG	N
Choctaw *.	NTV	do.	300, 600.	PG	N
City of Wilmington ⁴ .	WQC	Marconi, 400.	300, 600.	PG	X
Concord *.	NQH	U. S. Navy.	300, 600.	PG	N
Constellation *.	NEY	do.	300, 600.	PG	N
Cumberland *.	NSZ	do.	300, 600.	PG	N
Cuyama *.	NOD	do.	300, 600.	PG	N
Dahlgren *.	NVY	do.	300, 600.	PG	N
De Long *.	NWB	do.	300, 600.	PG	N
Elfrieda *.	NEV	do.	300, 600.	PG	N
Fish Hawk *.	NFV	do.	300, 600.	PG	N
Foote *.	NWF	do.	300, 600.	PG	N
Fox *.	NWJ	do.	300, 600.	PG	N
Frederick *.	NJS	do.	300, 600.	PG	N
Granite State *.	NNZ	do.	300, 600.	PG	N
Hartford *.	NGV	do.	300, 600.	PG	N
Hawk *.	NSM	do.	300, 600.	PG	N
Hercules *.	NTW	do.	300, 600.	PG	N
Huntington *.	NWG	do.	300, 600.	PG	N
Huntress *.	NSN	do.	300, 600.	PG	N
Idaho *.	NHN	do.	300, 600.	PG	N
Intrepid *.	NFY	do.	300, 600.	PG	N
Iwana *.	NTY	do.	300, 600.	PG	N
James McGee ¹ .	KTP	Marconi.	300, 600.	PG	N
J. W. Thompson ² .	KXT	do.	300, 600.	PG	N
Lackawanna ³ .	KOP	do.	300, 600.	PG	N
Lancaster *.	NEW	U. S. Navy.	300, 600.	PG	N

* Rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the U. S. Naval Communication Service, Radio, Va. Government, owner of vessel.

¹ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

² Range, 100; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Bay Steamship Co. of America (Ltd.), owner of vessel.

³ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Brynhilda Shipping Corporation, owner of vessel.

⁴ Range, 150; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Alexander Sprunt & Son, owner of vessel.

⁵ R. Lawrence Smith (Inc.), owner of vessel.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—Continued.

Vessel.	Call signal.	System.	Wave lengths.	Serv-ice.	Hours.
Massasoit *	NUB	U. S. Navy	300, 600.....	PG	N
May ¹	KZI	Marconi	300, 600.....	PG	N
Mississippi *	NKE	U. S. Navy	300, 600.....	PG	N
Modoc *	NTO	do.	300, 600.....	PG	N
Mohave *	NUD	do.	300, 600.....	PG	N
Mohawk *	NUE	do.	300, 600.....	PG	N
Mohegan *	NZA	do.	300, 600.....	PG	N
Mundale ²	KUJ	Marconi	300, 600.....	PG	N
N-1 *	NZE	U. S. Navy	300, 600.....	PG	N
N-2 *	NZF	do.	300, 600.....	PG	N
N-3 *	NZG	do.	300, 600.....	PG	N
N-4 *	NZH	do.	300, 600.....	PG	N
N-5 *	NZI	do.	300, 600.....	PG	N
N-6 *	NZJ	do.	300, 600.....	PG	N
N-7 *	NZK	do.	300, 600.....	PG	N
Narkeeta *	NUF	do.	300, 600.....	PG	N
Oneida *	NSO	do.	300, 600.....	PG	N
Pawnee *	NUH	do.	300, 600.....	PG	N
Pawtucket *	NUJ	do.	300, 600.....	PG	N
Penacook *	NUK	do.	300, 600.....	PG	N
Pentucket *	NUL	do.	300, 600.....	PG	N
Peschontas *	NOU	do.	300, 600.....	PG	N
Powhatan *	NUP	do.	300, 600.....	PG	N
Pueblo *	NDN	do.	300, 600.....	PG	N
Relief *	NHK	do.	300, 600.....	PG	N
Rocket *	NUI	do.	300, 600.....	PG	N
Rodgers *	NWT	do.	300, 600.....	PG	N
Samoset *	NUU	do.	300, 600.....	PG	N
Schley *	NKT	do.	300, 600.....	PG	N
Seattle *	NWE	do.	300, 600.....	PG	N
Seabago *	NUY	do.	300, 600.....	PG	N
Shaw *	NUV	do.	300, 600.....	PG	N
Shubrick *	NKU	do.	300, 600.....	PG	N
Sioux *	NWU	do.	300, 600.....	PG	N
Somers *	NWV	do.	300, 600.....	PG	N
Southery *	NJY	do.	300, 600.....	PG	N
Standish *	NUY	do.	300, 600.....	PG	N
Surveyor *	NQU	do.	300, 600.....	PG	N
Sylvia *	NSS	do.	300, 600.....	PG	N
Tecumseh *	NUZ	do.	300, 600.....	PG	N
Thornton *	NWX	do.	300, 600.....	PG	N
Tillamook *	NWW	do.	300, 600.....	PG	N
Tingey *	NWY	do.	300, 600.....	PG	N
Traffic *	NVA	do.	300, 600.....	PG	N
Transfer *	NVB	do.	300, 600.....	PG	N
Triton *	NVC	do.	300, 600.....	PG	N
Unadilla *	NVD	do.	300, 600.....	PG	N
Waban *	NVH	do.	300, 600.....	PG	N
Wahnetta *	NVI	do.	300, 600.....	PG	N
Wanda *	NWZ	do.	300, 600.....	PG	N
Wellington ³	KMR	Marconi	300, 600.....	PG	N
Wm. G. Warden ⁴	KNF	do.	300, 600.....	PG	N
Wompatuck *	NVJ	U. S. Navy	300, 600.....	PG	N

¹ Rate, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by J. R. De Lamar, owner of vessel, yacht.

² Munson Steamship Co., owner of vessel.

³ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Cook-Cummer Steamship Co., owner of vessel.

⁴ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Call signal.	Vessel.	Call signal.	Vessel.	Call signal.	Vessel.
KIO	Brynhilda.	NSY	Boxer.	NAVY	Dahlgren.
KMR	Wellington.	NSZ	Cumberland.	NWB	De Long.
KNF	Wm. G. Warden.	NTH	Accomac.	NWE	Seattle.
KOP	Lackawanna.	NTJ	Active.	NWF	Footo.
KPS	Benjamin Brewster.	NTM	Alice.	NWG	Huntington.
KTP	James McGee.	NTN	Apache.	NWJ	Fox.
KUJ	Mundale.	NTO	Mohave.	NWT	Rodgers.
KXS	Britannia.	NTV	Choctaw	NWU	Shubrick.
KXT	J. W. Thompson.	NTW	Hercules.	NWV	Somers.
KZI	May.	NTY	Iwana.	NWW	Tillamook.
NDN	Pueblo.	NUB	Massasoit.	NWX	Thornton.
NEV	Elfrida.	NUD	Modoc.	NWY	Tingey.
NEW	Lancaster.	NUE	Mohawk.	NWZ	Wanda.
NEY	Constellation.	NUF	Narkeeta.	NXB	A-2.
NFV	Fish Hawk.	NUH	Pawnee.	NXC	A-3.
NFY	Intrepid.	NUJ	Pawtucket.	NXD	A-4.
NGC	Boston.	NUK	Penacook.	NXE	A-5.
NGV	Hartford.	NUL	Pentucket.	NXF	A-6.
NHK	Relief.	NUP	Powhatan.	NXG	A-7.
NHN	Idaho.	NUT	Rocket.	NXH	B-1.
NJS	Frederick.	NUU	Samoset.	NXI	B-2.
NJY	Southery.	NUV	Sebago.	NXJ	B-3.
NKE	Mississippi.	NUW	Sioux.	NXK	C-1.
NKT	Schley.	NUY	Standish.	NXL	C-2.
NKU	Shaw.	NUZ	Tecumseh.	NXM	C-3.
NNZ	Granite State.	NVA	Traffic.	NXN	C-4.
NOD	Cuyama.	NVB	Transfer.	NXO	C-5.
NOU	Pocahontas.	NVC	Triton.	NZA	Mohagan.
NQG	Callao.	NVD	Unadilla.	NZE	N-1.
NQH	Concord.	NVH	Waban.	NZF	N-2.
NQU	Surveyor.	NVI	Wahneta.	NZG	N-3.
NSM	Hawk.	NVJ	Wompatuck.	NZH	N-4.
NSN	Huntress.	NVO	Alleen.	NZI	N-5.
NSO	Oneida.	NVU	Bagley.	NZJ	N-6.
NSP	Arapahoe.	NVV	Barney.	NZK	N-7.
NSS	Sylvia.	NVW	Biddle.	WQC	City of Wilmington.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

Station.	Call signal.	Wave lengths.	Serv-ice.	Hours.	Station controlled by—
Bar Harbor, Me.	1ZI	200, 300, 425, 600.	P	X	Arthur H. Lawford.
Manhattan, Kans.	9YV	300, 425.	P	X	Kansas State Agricultural College.
Philadelphia, Pa.	3ZO	200, 300, 425, 600.	P	X	Maynard C. Morris.
San Bernardino, Cal.	6YP	200, 500.	P	X	Y. M. C. A.
Superior, Wis.	9ZO	200, 300, 425, 600.	P	X	F. W. Keeler.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name = Name of station.

G. loc = Geographical location: O = west longitude, N = north latitude.

Call = Call letters assigned.

System = Radio system used and sparks per second.

Range = Normal range in nautical miles.

W. L. = Wave lengths assigned: Normal wave lengths in italics.

Service—Nature of service maintained:

PG=General public.

PR=Limited public.

P=Private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Ferne list.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

CAFE ST. ELIAS, ALASKA.—Strike out all particulars.

KENSINGTON, ALASKA.—G. loc., O. 135° 06' 54", N. 58° 52' 06"; range, 100-250; system, Marconi, 480; W. L., 300, 600, 1650; service, PG; hours, 15-minute periods commencing at 9m, 1s, and 7s; rates, 6 c. per word 60 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Co. The station also communicates with Juneau and Sitka, Alaska; rate, 6 c. per word 60 c. minimum per radiogram, domestic count.

LEWISTON, MONT.—Name, Lewistown, Mont.; W. L., 300, 600, 1600.

WAHIAWA, ISLAND OF OAHU, HAWAII.—Range, 400; W. L., 300, 550, 600, 750; hours, for PG service, N, for special interisland service, 7m-12m, 1s-5.30s, for service with Tutuila and Apia, Samoa, 8s-2m; rates, change rate to Apia and Papeete to read: Rate to Apia, 50 c. per word no minimum, rate to Tutuila, 10 c. per word \$1 minimum per radiogram. Rate for PG service, 10 c. per word \$1 minimum per radiogram. Notes, Radio station operated and controlled by the Mutual Telephone Co. (Ltd.). The station conducts special interisland service with Kawaihae, Lahaina, and Lihue, Hawaii, and also communicates with Tutuila and Apia, Samoa.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ADMIRAL DEWEY.—Note, Radio station operated and controlled by the Pacific Steamship Co., charterer of vessel. Pacific-Alaska Navigation Co., owner of vessel.

ADMIRAL EVANS.—Note, Radio station operated and controlled by the Pacific Steamship Co., charterer of vessel. Pacific-Alaska Navigation Co., owner of vessel.

ADMIRAL FARRAGUT.—Note, Radio station operated and controlled by the Pacific Steamship Co., charterer of vessel. Pacific-Alaska Navigation Co., owner of vessel.

ADMIRAL GOODRICH.—Note, Radio station operated and controlled by the Pacific Steamship Co., charterer of vessel. Pacific-Alaska Navigation Co., owner of vessel.

ADMIRAL SCHLEY.—Note, Radio station operated and controlled by the Pacific Steamship Co., charterer of vessel. Pacific-Alaska Navigation Co., owner of vessel.

ADMIRAL WATSON.—Note, Radio station operated and controlled by the Pacific Steamship Co., charterer of vessel. Pacific-Alaska Navigation Co., owner of vessel.

BRAMELL POINT.—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X. C. A. CANFIELD.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600.

CALIFORNIA (NCZ).—(C all, NDF.

CAMINO.—Strike out all particulars.

CHICAGO (WFI).—Strike out all particulars.

CITY OF SEATTLE.—Notes, Radio station operated and controlled by the Marconi Co. Pacific Steamship Co., charterer of vessel. Pacific-Alaska Navigation Co., owner of vessel.

COLORADO (NDN).—Strike out all particulars.

EL OCCIDENTE.—System, Marconi, 1,000; W. L., 300, 450, 600.

- EL VALLE.**—System, Marconi, 480; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- GUANTANAMO.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- JOSEPH R. PARROTT.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram.
- MARYLAND.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X. Notes, Radio station operated and controlled by the Marconi Co. Crew Levick Co., owner of vessel.
- MARYLAND (NJS).**—Strike out all particulars.
- MEXICAN.**—Hours, N.
- MILLINOCKET.**—System, Marconi, 480; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- NAVAHOE.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- NAVAJO (WNI).**—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600.
- NORMAN BRIDGE.**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- OREGON (WOC).**—Notes, Radio station operated and controlled by the Marconi Co. Wilson Bros. Co., owner of vessel.
- PAULSBORO.**—Notes, Radio station operated and controlled by the Marconi Co. Vacuum Oil Co., owner of vessel.
- PEARL SHELL.**—Range, 250; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
- PERE MARQUETTE.**—W. L., 300, 500, 600. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PERE MARQUETTE 17.**—W. L., 300, 500, 600. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PERE MARQUETTE 18.**—W. L., 300, 500, 600. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PERE MARQUETTE 19.**—W. L., 300, 500, 600. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PERE MARQUETTE 20.**—W. L., 300, 500, 600. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PRESIDENT.**—Notes, Radio station operated and controlled by the Marconi Co. Pacific Coast Co., owner of vessel.
- RESOLUTE.**—Range, 200; system, De Forest, 240; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Merritt & Chapman Derrick & Wrecking Co., owner of vessel.
- SENATOR.**—Notes, Radio station operated and controlled by the Marconi Co. Pacific Steamship Co., charterer of vessel. Pacific-Alaska Navigation Co., owner of vessel.
- SEWARD.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Seward Navigation Co., owner of vessel.
- SPOKANE.**—Notes, Radio station operated and controlled by the Marconi Co. Pacific Steamship Co., charterer of vessel. Pacific-Alaska Navigation Co., owner of vessel.
- TENNESSEE (NUG).**—Strike out all particulars.
- UMATILLA.**—Notes, Radio station operated and controlled by the Marconi Co. Pacific Steamship Co., charterer of vessel. Pacific-Alaska Navigation Co., owner of vessel.
- WASHINGTON (NWE).**—Strike out all particulars.
- WESTERN STATES.**—W. L., 300, 440, 500, 600; hours, N.
- WEST VIRGINIA (NWG).**—Strike out all particulars.
- WICO.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

MISCELLANEOUS.

COMMERCIAL RADIO OPERATORS LICENSED DURING MONTH OF OCTOBER, 1916.

Extra first grade.

Date.	Licensee.	Address.	Serial No.	Where issued. ¹
18	Sibley, Eugene	1125 E. Capitol St., Washington, D. C.	54	Washington.
27	Schindler, Emil R.	438 W. 23d St., New York, N. Y.	57	Brooklyn. ²
24	Scott, Carl A.	U. S. S. Ranger, Boston, Mass.	56	Washington.
19	Young, Leonard P.	S. S. Sixaola, New York, N. Y.	55	Brooklyn. ²

First grade.

9	Abbey, Harold	R. F. D. No. 1, Eugene, Oreg.	14134	Seattle.
24	Abrams, George E.	S. S. H. M. Flagler, Key West, Fla.	14161	New Orleans.
7	Acree, Charles H.	U. S. Naval Radio Station, New Orleans, La.	12300	Do.
29	Allen, John W.	236 Hale St., Beverly, Mass.	12183	Baltimore.
17	Ault, Arthur K.	1152 Columbia Ave., Baltimore, Md.	12184	Do.
26	Austin, Hervey G.	1036 Polk St., San Francisco, Cal.	13905	San Francisco.
30	Barkley, Patrick J.	S. S. Herodia, New Orleans, La.	14163	New Orleans.
18	Bauchou, Leon J.	Mayfield, Cal.	12398	San Francisco.
28	Beckerman, Benjamin	107 Herze St., Brooklyn, N. Y.	14091	New York.
28	Beckerman, Michael	do.	14092	Do.
31	Bermingham, James L.	54 A St., Waveland, Mass.	14271	Boston.
21	Bevitt, Edwin R.	3914 3d St., San Diego, Cal.	13901	San Francisco.
16	Bigelman, Herbert C.	139 Springfield Ave., Rutherford, N. J.	12966	Norfolk. ²
25	Bodin, Henry	5 Fella Pl., San Francisco, Cal.	13903	San Francisco.
6	Bolt, Arthur L.	4901 Budlong Ave., Los Angeles, Cal.	12393	Do.
3	Brede, Erwin F.	55 Melbourne Ave., Detroit, Mich.	13726	Detroit.
16	Brusseau, Charles J.	262 Vallette St., New Orleans, La.	14157	New Orleans.
4	Burgess, Hubert A.	7801 44th St. SW., Seattle, Wash.	14133	Seattle.
26	Campbell, Alexander	204 Perry St., Cape May, N. J.	12186	Baltimore.
30	Carpenter, Irving T.	416 Public St., Providence, R. I.	14093	New York.
24	Cawman, David L.	1531 Sewall Ave., Asbury Park, N. J.	14088	Do.
18	Copak, George J.	509 S. 10th St., Newark, N. J.	14911	Brooklyn. ²
18	Crum, Arles A.	363 W. 58th St., New York, N. Y.	14909	Do.
18	Dillon, Joseph A.	407 S. Claiborne Ave., New Orleans, La.	14908	Do.
16	Doughty, Dennis R.	153 E. 86th St., New York, N. Y.	14906	Do.
31	Dunlap, William T.	S. S. Alaska, Pier 2, Seattle, Wash.	14139	Seattle.
21	Ellis, Homer D.	28 Winslow Rd., Brookline, Mass.	14268	Boston.
2	Estrada, Miss Maria D.	11th and N Sts. NW., Washington, D. C.	12015	Washington.
2	Ferguson, George B.	24 Cottage St., Bayonne, N. J.	14904	Brooklyn. ²
16	Folsom, Harold P.	445 Central St., Winchendon, Mass.	14270	Boston.
2	Ford, Schuyler R.	396 E. 16th St., Brooklyn, N. Y.	14905	Brooklyn. ²
27	Forsyth, James F.	108 Prospect St., Somerville, Mass.	14090	New York.
10	Fox, Irving A.	Piedmont Park, Oakland, Cal.	12394	San Francisco.
20	Gaskey, Sigmund	73 E. 30th St., Bayonne, N. J.	14160	New Orleans.
19	Gilbert, Harry L.	714 Denny Way, Seattle, Wash.	14135	Seattle.
23	Grimshaw, Herbert R.	55 Wood St., Rutherford, N. J.	14914	Brooklyn. ²
19	Guy, Raymond	342 Broadway, Tottenville, N. Y.	14912	Do.
23	Hallett, Gena C.	4034 Latona Ave., Seattle, Wash.	14138	Seattle.
5	Harrison, Percy W.	4025 Ellis Ave., Chicago, Ill.	13729	Chicago.
10	Hassler, Bert R.	818 E. 4th St., Santa Ana, Cal.	12396	San Francisco.
20	Haverkamp, Herman O.	2200 Marengo St., New Orleans, La.	14159	New Orleans.
26	Hellig, David J.	1221 Arch St., Philadelphia, Pa.	12185	Baltimore.
10	Hendrix, Paul A.	1106 Bush St., San Francisco, Cal.	12395	San Francisco.
18	Hornung, Julius L.	203 E. 64th St., New York, N. Y.	14907	Brooklyn. ²
26	La Rue, Lester J.	179 Marcy Ave., Brooklyn, N. Y.	14916	Do.
20	Lee, James G.	Box 62, Vancouver, Wash.	14137	Seattle.
20	Lockette, Lester	Care of Federal Telegraph Co., San Francisco, Cal.	14136	Do.
17	Lohry, Ross B.	1921 Irving Ave., East Oakland, Cal.	12397	San Francisco.
19	Loomis, Thomas T.	Blencoe, Iowa	12400	Do.
26	McDonald, Edward F.	15 Beacon St., Clinton, Mass.	14089	New York.
31	Marshall, Emanuel J.	402 E. 83d St., New York, N. Y.	14918	Brooklyn. ²
18	Miché, John A.	568 Waller St., San Francisco, Cal.	12399	San Francisco.
23	Morrell, Arthur C.	Navy Y. M. C. A., Brooklyn, N. Y.	14915	Brooklyn. ²
3	Pardridge, Clarence R.	521 Nimons St., Saginaw, Mich.	13728	Detroit.
26	Peterson, Kenneth	1223 West Ave., Eureka, Cal.	13904	San Francisco.
6	Philbrook, Robert G.	1 Linden Ave., Greenwood, Mass.	14266	Boston.
3	Risley, Warren B.	96 Marshall St., Conneaut, Ohio.	13727	Detroit.
27	Roberts, George F.	Stewart Hotel, San Francisco, Cal.	12388	San Francisco.
10	Salter, John R.	89 St. James Ave., Boston, Mass.	14267	Boston.
31	Schmitt, Lawrence R.	S. S. Creole, New York, N. Y.	14094	New York.
18	Schneider, Frank A.	25 Ridgewood Ave., Newark, N. J.	14910	Brooklyn. ²
24	Schneider, Sam	765 E. 160th St., New York, N. Y.	14087	New York.

¹ All licenses issued by radio inspectors of the Department of Commerce unless otherwise indicated.

² License issued by radio examining officer, Navy Department.

³ Licensed during month of September, papers being received at Bureau too late for publication in November Bulletin.

COMMERCIAL RADIO OPERATORS LICENSED DURING THE MONTH OF
OCTOBER, 1916—continued.

First grade—Continued.

Date.	Licensee.	Address.	Serial No.	Where issued. ¹
30	Slkes, Alvin R.....	Wayne, Mich.....	13730	Chicago.
31	Smith, Edmund F.....	659 Haight St., San Francisco, Cal.....	13906	San Francisco.
25	Spradley, Albert H.....	849 Calder Ave., Beaumont, Tex.....	14162	New Orleans.
19	Stevens, Charles E.....	Care of Standard Oil Co., Baton Rouge, La.....	14158	Do.
26	Wimpfheimer, Gustave R.....	1219 Wheeler Ave., New York, N. Y.....	14917	Brooklyn. ²
18	Young, Ross W.....	25 Elm St., New York, N. Y.....	14086	New York.

Second grade.

5	Beechel, George H. J.....	220 78th St., Brooklyn, N. Y.....	13824	Brooklyn. ³
18	Coombs, George T.....	Castine, Me.....	12070	Boston.
27	Foster, Richard H.....	Miami, Fla.....	12802	Key West. ³
25	Herndon, Landon C. ⁴	409 Middle St., Portsmouth, Va.....	13055	Fort Monroe, Va. ⁴
23	Hill, Claude N.....	Fort McKinley, Portland, Me.....	12071	Boston.
5	Quong, Moy B.....	172 2d St., Milwaukee, Wis.....	12341	Chicago.
10	Wihl, Otto H.....	72 Woodward Ave., San Francisco, Cal.....	13273	San Francisco.

¹ All licenses issued by radio inspectors of Department of Commerce unless otherwise indicated.

² License issued by radio examining officer, Navy Department.

³ Licensed during month of September, papers being received at Bureau too late for publication in November Bulletin.

⁴ License issued by radio examining officer, War Department.

RADIO SERVICE PERSONNEL.

H. C. Gawler, who has been serving as captain in the Signal Corps, Massachusetts National Guard, on the Mexican border, has returned to his duties as radio inspector at Boston, Mass.

Charles Blankenship, assistant radio inspector, who has been in charge of the first district during the absence of Radio Inspector H. C. Gawler, has been granted annual leave, at the expiration of which he will be assigned to the port of Norfolk, Va.

Ellery W. Stone, assistant radio inspector at San Francisco, Cal., is making an extended inspection trip through southern California and points in New Mexico and Arizona.

Otto R. Redfern, formerly manager of the Duluth (Minn.) station of the Marconi Wireless Telegraph Co. of America, has been appointed an assistant radio inspector in the service of the Bureau at New York, N. Y.

Joseph H. Hallock, of Underwood, Wash., has been appointed assistant radio inspector in the service of the Bureau and has been temporarily assigned to Norfolk, Va. Upon the assignment of Assistant Radio Inspector Blankenship to the port of Norfolk, Mr. Hallock will be assigned to duty in the fourth and fifth districts.

The temporary appointment of H. D. Hayes as assistant radio inspector at San Francisco, Cal., has been extended for a period of three months.

NEW INTERNATIONAL LIST.

The Berne bureau has announced the completion of the fourth edition of the Liste Alphabetique des Indicateurs D'Appel (Alphabetical List of Call Letters) of the radio stations of the world.

This publication may be procured from the Director, International Bureau of the Telegraph Union, Radiotelegraphic Service, Berne,

Switzerland, at the price of 1 franc 30 centimes per copy, plus 35 centimes postage. Remittances should be made by international postal money orders.

REGULATION OF RADIO APPARATUS IN CANADIAN TERRITORIAL WATERS.

The following extracts from the Canadian Radiotelegraph Act and Regulations concerning the operation of radio equipments on vessels in Canadian territorial waters are published for the information and guidance of masters and radio operators of American vessels visiting Canadian ports.

73. *Superfluous signals.*—The transmission of superfluous signals by any ship or coast station is absolutely prohibited; trials and practices are forbidden except under such circumstances as to preclude the possibility of interference with other stations.

103. *Ship stations in Canadian territorial waters.*—The radiotelegraph stations on board ships (other than H. M. ships of war or Canadian Government vessels) shall not be worked while such ships are within the territorial waters of Canada, unless specific permission is granted thereby by the controlling Canadian coast stations for the locality, and then only provided such working does not interfere with the operation of any coast station established in Canada, and that the provisions of the Radiotelegraph Convention of London, 1912, and the Service Regulations annexed thereto, are strictly observed.

104. *Ship stations in Canadian harbours.*—(a) The radiotelegraph stations on board ships (other than H. M. ships of war or Canadian Government vessels) shall not be worked whilst such ships are within a harbour of the Dominion of Canada.

(b) For the proper enforcement of the above, ships of British register in Canadian harbours must completely disconnect their aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show they are properly disconnected.

(c) Ships of foreign register in a Canadian harbour must (subject to the provisions of the following subsection (d)) take down their aerial wires completely and disconnect the same from their radiotelegraph apparatus.

(d) Ships of foreign register remaining in a Canadian harbour for less than twelve hours may, at the discretion of the competent naval authority, be permitted to leave their aerials up, provided the same are disconnected in accordance with the provisions of subsection (b) of this regulation.

WARNING TO RADIO OPERATORS.

The attention of all radio operators on American vessels engaged in foreign trade is invited to Article VI of the London convention and paragraph 209, page 74, of the regulations of the Department, prohibiting the transmission of superfluous signals, and to Article XXXV of the London convention, requiring the transmission of radiograms, except as outlined in that article, to the nearest coastal station.

The Department has recently received several complaints from foreign Governments of interference caused by the radio stations on board vessels of the United States while in or near foreign territory, the greater part of which has been caused by the attempts of radio operators to transmit long distances and by the transmission of superfluous signals, in violation of the above regulations.

All radio operators are warned that they must obey the international regulations and the regulations of the Department, especially as regards interference with the operation of foreign radio stations, and any operator found guilty of willfully interfering with the operation of other stations may suffer the suspension or revocation of his operator license.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, January 1, 1917—No. 25.



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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	System.	Wave lengths.	Service.	Hours.
Cape Cod, Mass. ¹	NAE	U. S. Navy.....		O.....	N
Craftonville, Cal. ²	KJQ	Massie, 100.....	1,610...	Limited commercial	X
King Cove, Alaska ³	KJK			do.....	
San Francisco, Cal. ⁴	NPG	U. S. Navy.....		O.....	N

¹ G. loc., O 70° 03' 54", N. 42° 02' 22". Radio station operated and controlled by the United States Naval Communication Service, Radio, Va.

² G. loc., O 117° 02' 30", N. 34° 05' 10"; range, 250. Radio station operated and controlled by the Southern California Edison Co. The station is limited to communication with stations of the Southern California Edison Co. and Southern Sierra Power Co. on business of a private nature.

³ Radio station operated and controlled by the Pacific-American Fisheries Co.

⁴ G. loc., O 122° 22' 02", N. 37° 48' 30". Radio station operated and controlled by the United States Naval Communication Service, Radio, Va.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Service.	Hours.
Alpena ¹	WCS	Marconi.....	300, 600.....	PG	
Ann Arbor No. 6 ²	WDQ	do.....	300, 600.....	PG	
Commodore ³	WFZ				
Edward Luckenbach.....	KGQ	Kilbourne & Clark.....	300, 600.....		
Fordonian.....	KRU				
F. Q. Barstow ⁴	KNQ	Marconi.....	300, 600.....	PG	
Huron ⁵	WCH	do.....	300, 600.....	PG	
Marina ⁶	KNU	Marconi, 1,000.....	300, 450, 600.....	PG	N
Maul ⁶	WMR	Marconi.....	300, 600.....		
Nirvana ⁷	KYK	do.....	300, 600.....	PG	
Paul Jones ⁸	KVU	do.....	300, 600.....	PG	
Pennant ⁹	KME	do.....	300, 600.....	PG	
Samuel Mitchell ¹⁰	WEJ	do.....	300, 600.....	PG	
Velero ¹¹	WHV	Composite.....	300.....	PG	X
W. H. Tilford ⁴	KPD	Marconi.....	300, 600.....	PG	
Wyandotte ¹	WCO	do.....	300, 600.....	PG	

¹ Rates, 2 c. per word 20 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Wyandotte Transportation Co., owner of vessel.

² Rates, 2 c. per word 20 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Ann Arbor Railroad Co., owner of vessel.

³ Illinois Naval Battalion, owner of vessel.

⁴ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

⁵ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Bull Insular Steamship Co., owner of vessel.

⁶ Matson Navigation Co., owner of vessel.

⁷ Rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Rodman Wanamaker, owner of vessel, yacht.

⁸ Radio station operated and controlled by James W. Elwell & Co., owner of vessel.

⁹ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Pierce Oil Corporation, owner of vessel.

¹⁰ Rates, 2 c. per word 20 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Huron Transportation Co., owner of vessel.

¹¹ Range 50; rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by G. Allan Hancock, owner of vessel, yacht.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KGQ	Edward Luckenbach..... b	NAE	Cape Cod, Mass..... c
KJK	King Cove, Alaska..... c	NPG	San Francisco, Cal..... c
KJQ	Craftonville, Cal..... c	WCH	Huron..... b
KME	Pennant..... b	WCO	Wyandotte..... b
KNQ	F. Q. Barstow..... b	WCS	Alpena..... b
KPD	W. H. Tilford..... b	WDQ	Ann Arbor No 6..... b
KRU	Foronlan..... b	WEJ	Samuel Mitchell..... b
KVC	Paul Jones..... b	WFZ	Commodore..... b
KXC	Marina..... b	WHV	Velero..... b
KYK	Nirvana..... b	WMR	Maui..... b

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Buffalo, N. Y.....	8ZJ	<i>200, 425</i>	P	X	Edward C. Wahl.
Buffalo, N. Y.....	8ZP	<i>200, 300, 425, 600</i>	P	X	W. D. Woodcock.
Charlestown, R. I.....	1XW	<i>200, 300, 425, 600</i>	P	X	Ralph C. Watrous.
Chicago, Ill.....	9ZN	<i>200, 300, 425, 600</i>	P	X	Ralph H. G. Mathews.
Fresno, Cal.....	5ZD	<i>200, 425</i>	P	X	Robert C. Denny.
Montclair, N. J.....	2ZE	<i>200, 325</i>	P	X	Paul F. Godley.
University, Va.....	3YV	<i>200, 350, 425</i>	P	X	University of Virginia.
Winfield, L. I., N. Y.....	2XP	<i>300, 450, 600, 1000, 1600, 3000</i>	P	X	Louis G. Pacent.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XW	First district: Charlestown, R. I.....	5ZD	Fifth district: Fresno, Cal.
2XP	Second district: Winfield, Long Island, N. Y.....	8ZJ	Eighth district: Buffalo, N. Y.
ZZE	Montclair, N. J.....	8ZP	Buffalo, N. Y.
3YV	Third district: University, Va.....	9ZN	Ninth district: Chicago, Ill.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc =Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P=Private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

NEW ORLEANS, LA. (WHK).—Hours, 7.15m–8m, 8.40m–9m, 10.15m–10.55m, 11.40m–12m, 1.15s–2s, 3.15s–4s, 5.15s–6s, 8.15s–8.55s, 10.15s–11s.

NORTH TRURO, MASS.—Strike out all particulars.

YERBA BUENA, CAL.—Strike out all particulars.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

DADE.—Strike out all particulars.

EDWARD L. DOHENY.—W. L., 300, 450, 600.

GOVERNOR.—System, Marconi, 400. Note, Radio station operated and controlled by the Marconi Co. Pacific Coast Co., owner of vessel. Pacific Steamship Co., charterer of vessel.

IAQUA.—Note, Radio station operated and controlled by the Marconi Co. Fred D. Parr (Parr-McCormick Steamship Co.), owner of vessel.

JOSEPHINE.—Strike out all particulars.

LACKAWANNA.—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. R. Lawrence Smith (Inc.), owner of vessel.

MUNDALE.—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Munson Steamship Co., owner of vessel.

NELSON.—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

RELIEF (KRJ).—Range, 200; system, Kilbourne & Clark, 1,000; W. L., 300, 450, 600.

ROSE CITY.—System, Marconi, 240.

ROYAL ARROW.—Range, 300; system, Marconi, 1,000; hours, N.

SAN MATEO.—System, Composite, 1,000; rates, 8 c. per word 80 c. minimum per radiogram.

SIBIRIA.—Strike out all particulars.

ZELANDIA.—Note, Radio station operated and controlled by the National Electric Signaling Co. Universal Transportation Co., owner of vessel.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

FRUITVALE, CAL.—Radio station operated and controlled by the National Radio Co.

LEONIA, N. J.—Strike out all particulars.

MADISON, WIS.—W. L., 425, 1700, variable.

NEW ROCHELLE, N. Y.—W. L., 200, 350, 425.

ROCKFORD, ILL.—Strike out all particulars.

SAN FRANCISCO, CAL. (6XO).—Radio station operated and controlled by the National Radio Co.

WATCHAUG POND, R. I.—Strike out all particulars.

MISCELLANEOUS.

COMMERCIAL RADIO OPERATORS LICENSED DURING MONTH OF NOVEMBER, 1916.

Extra first grade.

Date.	Licensee.	Address.	Serial No.	Where issued. ¹
27	Jones, William H.....	335 8th St., Lorain, Ohio.....	59	Cleveland.
9	*Voelker, Raymond.....	65 W. 107th St., New York, N. Y.....	58	Brooklyn. ²

First grade.

5	Austin, Russell F.....	210 3d St., Riverside, Cal.....	13853	Los Angeles.
21	Baldwin, Edward.....	623 Crawford Ave., Dixon Ill.....	13738	Chicago.
9	*Barker, Charles R.....	712 Gravier St., New Orleans, La.....	14165	New Orleans.
21	Barron, William T.....	153 Indiana Ave., Valparaiso, Ind.....	13739	Chicago.
24	Bartlett, Dexter S.....	1107 Columbia St., Seattle, Wash.....	14147	Seattle.
16	*Batchelder, Isaac H.....	409 Jefferson Ave., Bristol, Pa.....	12914	Philadelphia. ²
16	*Beane, Edwin A.....	Fort Morgan, Ala.....	14170	New Orleans.
6	Beraldo, Dewey.....	943 E. 10th St., Los Angeles, Cal.....	13857	Los Angeles.
17	*Bergen, Matthew L.....	94 Vanderveer St., Brooklyn, N. Y.....	14965	New York.
9	*Bernhard, Arthur L.....	541 West St., Brooklyn, N. Y.....	14954	Do.
9	Biscioti, Bernard J.....	608 Carpenter St., Philadelphia, Pa.....	14923	Brooklyn. ²
23	*Black, Elmer M.....	10 Cliff St., New London, Conn.....	14273	Boston.
2	Bode, Hugo P.....	6315 Beacon Ave., Seattle, Wash.....	14140	Seattle.
17	*Bossen, John A.....	110 E. 41st St., New York, N. Y.....	14964	New York.
29	Bowen, Walter.....	2110 Catrella Ave., Los Angeles, Cal.....	13860	Los Angeles.
14	*Bowers, Clio.....	1014 Lime Ave., Long Beach, Cal.....	13915	San Francisco.
10	*Brady, Albert E.....	San Francisco, Cal.....	13912	Do.
7	Carrier, Roy D.....	Care Tropical Radio Telegraph Co., New Orleans, La.....	14164	New Orleans.
14	*Chambers, Fred B.....	138 Park Row, New Orleans, La.....	14169	Do.
28	*Churchill, John R.....	503 W. 169th St., New York, N. Y.....	14174	Do.
2	Clement, Luther.....	156 Locust Ave., Valparaiso, Ind.....	13732	Chicago.
11	*Coffin, Richard.....	54 Houston St., Mobile, Ala.....	14166	New Orleans.
24	*Cohen, Arthur.....	560 Beck St., New York, N. Y.....	14171	Do.
29	*Conkling, Elliott C.....	1305 Josephine St., New Orleans, La.....	14175	Do.
21	Cooper, C. B.....	4018 Eastern Ave., Seattle, Wash.....	14145	Seattle.
4	*Crous, Gerhardus C.....	480 Pine St., San Francisco, Cal.....	13907	San Francisco.
23	*Darcy, Charles B.....	89 Suydam St., Brooklyn, N. Y.....	14919	Brooklyn. ²
3	Darlington, Albert.....	511 Park Ave., W. New York, N. J.....	14920	Do. ²
10	*Dillon, Lyle.....	317 S. Norton Ave., Los Angeles, Cal.....	13852	Los Angeles.
10	*Dillon, Wm. F.....	72 Division St., Newport, R. I.....	14958	New York.
10	*Doherty, Frank J.....	724 Marcy Ave., Brooklyn, N. Y.....	14957	Do.
27	*Downey, William E.....	Y. M. C. A., Los Angeles, Cal.....	13863	Los Angeles.
3	*Driver, Lloyd C.....	25 Elm St., New York, N. Y.....	14068	New York.
1	*Duna, Roman.....	437 Ogden Ave., Jersey City, N. J.....	14067	Do.
4	Eddy, John L., jr.....	2202 Q St. NW., Washington, D. C.....	12016	Washington.
21	Emmerson, Frank V.....	449 High St., Portsmouth, Va.....	12967	Norfolk. ²
14	*Erich, William J.....	546 N. 4th St., San Jose, Cal.....	13914	San Francisco.
3	Feiler, Frederick W.....	269 W. Thayer St., Philadelphia, Pa.....	12912	Philadelphia. ²
8	Fessenden, Edgar H.....	820 Putnam Ave., Brooklyn, N. Y.....	14922	Brooklyn. ²
2	*Finley, Chester T.....	R. F. D. No. 9, Mansfield, Ohio.....	13734	Chicago.
13	*Fitzpatrick, William S.....	1212 Fourth Ave., Watervliet, N. Y.....	14167	New Orleans.
28	Flanders, A. D.....	200 S. Crysler St., Independence, Mo.....	13456	Fort Leavenworth, Kans. ²
24	*Grasser, Charles H.....	2510 W. Huntingdon St., Philadelphia, Pa.....	14967	New York.
3	Harper, Ben.....	1319 Sunset Beach, Santa Monica, Cal.....	13851	Los Angeles.
8	*Heimbecker, Albert L.....	631 E. 227th St., New York, N. Y.....	14952	New York.
17	Henry, Ralph E.....	2627 1/2 N. Griffin Ave., Los Angeles, Cal.....	13866	Los Angeles.
18	*Hohlbein, Charles A.....	5515 Woodlawn Ave., Seattle, Wash.....	13920	San Francisco.
15	*Horney, Henry Q.....	1726 Van Buren St., New York, N. Y.....	14963	New York.
9	*Hutchison, Joseph L.....	1532 24th Ave., Seattle, Wash.....	14143	Seattle.
25	*Johnson, William.....	1117 3d Ave., Seattle, Wash.....	14148	Do.
14	*Johnston, J. Stanley.....	321 St. Charles St., New Orleans, La.....	14168	New Orleans.
27	Jolly, Carl F.....	403 W. Amerige Ave., Fullerton, Cal.....	13867	Los Angeles.
28	*Jones, James E.....	25 Elm St., New York, N. Y.....	14972	New York.
17	*Jorgensen, Edward T.....	4135 20th St., San Francisco, Cal.....	13918	San Francisco.
4	*Kay, William O.....	1330 N. 59th St., Philadelphia, Pa.....	14951	New York.
28	*Kearney, Nelson J.....	Maywood, N. J.....	14971	Do.
27	*Kellow, James C.....	R. F. D. No. 1, South Jacksonville, Fla.....	13360	Darien, C. Z. ²
27	Kemp, Victor H.....	803 E. 28th St., Los Angeles, Cal.....	13865	Los Angeles.

* License issued as renewal of expiring license without examination. Otherwise license issued on written examination.

¹ All licenses issued by radio inspectors of the Department of Commerce unless otherwise indicated.

² License issued by radio examining officer, Navy Department.

³ License issued by radio examining officer, War Department.

First grade—Continued.

Date.	Licensor.	Address.	Serial No.	Where issued.
10	Knise, Karl R.	42 Orleans St., Newark, N. J.	14924	Brooklyn ¹
1	*Langevin, Carl C.	9 Olds Pl., Hartford, Conn.	14920	Do.
29	*Lebowitz, Samuel.	2106 Cropsy Ave., Brooklyn, N. Y.	14974	New York.
15	Leband, Wallace H.	912 Ludian Rock Ave., Berkeley, Cal.	13917	San Francisco.
28	*Lewis, Paul S.	117 N. Main St., Sellersville, Pa.	14973	New York.
28	*Linden, Bernard H.	1131 E. 24th St., Oakland, Cal.	13924	San Francisco.
8	*Livesey, Elyvn.	242 N. Dittman St., Los Angeles, Cal.	13910	Do.
27	*Luckett, William L.	Fort Screven, Ga.	12189	Baltimore.
27	Lynde, Lawrence F.	1129 Locust Ave., Long Beach, Cal.	13882	Los Angeles.
5	Lyon, John D.	1141 Mendocino St., Altadena, Cal.	13855	Do.
3	Macdonald, Russell.	4146 44th Ave. SW., Seattle, Wash.	14141	Seattle.
6	*MacGregor, James A.	241 E. 24th St., New York, N. Y.	13359	Darien, C. Z. ¹
7	Maddox, Glenn E.	1321 3d Ave., Seattle, Wash.	14142	Seattle.
3	Marshall, George E.	2045 S. Lawrence Ave., Wichita, Kans.	13455	Fort Leavenworth, Kans. ¹
11	*Mathison, Volney G.	Core Federal Telegraph Co., San Francisco, Cal.	13913	San Francisco.
27	*McEwen, George E.	224 W. 40th St., Savannah, Ga.	12190	Baltimore.
28	McFarland, Dan L.	2317 Juliet St., Los Angeles, Cal.	13868	Los Angeles.
27	*Merrill, John S.	521 Broughton St., Savannah, Ga.	12191	Baltimore.
3	*Merry, Reginald A.	2108 Daly Ave., Bronx, New York, N. Y.	14100	New York.
16	Meyer, Jack.	418 10th St., Brooklyn, N. Y.	14927	Brooklyn ¹
23	*Michls, Valentine A.	292 Pequot Ave., New London, Conn.	14272	Boston.
1	*Minners, Arthur J.	699 E. 18th St., Brooklyn, N. Y.	14096	New York.
9	*Munn, Lloyd C.	30 Sherman Ave., Newark, N. J.	14953	Do.
14	*Murphy, John C.	378 State St., Brooklyn, N. Y.	14961	Do.
15	Nash, John A.	2029 Valentine Ave., New York, N. Y.	14926	Brooklyn ¹
6	Nelfert, Rueben G.	Box 26, Orange, Cal.	13856	Los Angeles.
22	*Nisley, Paul H.	2106 6th St., Harrisburg, Pa.	14966	New York.
27	*Ogles, Lucian G.	Care Marconi Co., San Francisco, Cal.	13923	San Francisco.
13	*O'Leary, John P.	Phoenix, Ariz.	13858	Phoenix, Ariz.
13	*Osterloh, Walter.	1337 Sargeant St., Baltimore, Md.	12187	Baltimore.
3	Owens, John.	2022 S. 21st St., Philadelphia, Pa.	12913	Philadelphia ¹
2	Peterson, Milton G.	712 Empire St., Ishpeming, Mich.	13733	Chicago.
23	Pieri, Donald.	703 E. 137th St., New York, N. Y.	14928	Brooklyn ¹
15	*Ribler, Nathan J.	531 E. 148th St., New York, N. Y.	14962	New York.
13	*Rich, Walter W.	119 Elm Ave., Mt. Vernon, N. Y.	14960	Do.
10	*Robinson, George N.	18 Jefferson St., Brooklyn, N. Y.	14956	Do.
25	*Rogers, Edward W.	1212 Canal St., New Orleans, La.	14172	New Orleans.
28	*Rogers, George H.	17 Battery Pl., New York, N. Y.	14970	New York.
28	*Rowe, Glenn S.	303 Hennen Annex, New Orleans, La.	14173	New Orleans.
20	Scharf, Theodore M.	1742 Madison St., Baltimore, Md.	12188	Baltimore.
3	*Seibold, William J.	1821 E. Thayer St., Philadelphia, Pa.	14099	New York.
6	*Sidnell, Robert G.	520 Thompson St., Ann Arbor, Mich.	13735	Chicago.
24	Smith, Noel.	363 E. 136th St., New York, N. Y.	14921	Brooklyn ¹
10	*Sproat, Hen.	S. S. California, New York, N. Y.	14959	New York.
17	*Taylor, David M.	Merchants Exchange Bldg., San Francisco, Cal.	13919	San Francisco.
27	*Theveneh, Clarence S.	371 Seymour Ave., Newark, N. J.	14968	New York.
27	Tombaugh, Fred E.	640 W. 42d St., Los Angeles, Cal.	13864	Los Angeles.
23	Townsend, George R.	320 Lionel Ave., Solvay, N. Y.	14930	Brooklyn ¹
5	Vodra, George G.	211 South Ave., Los Angeles, Cal.	13834	San Angeles.
8	*Walden, Myran.	994 57th St., Oakland, Cal.	13911	San Francisco.
3	Walters, Leslie.	153 E. 96th St., New York, N. Y.	14921	Brooklyn ¹
20	Waters, John E.	2002 N. Broadway, Santa Ana, Cal.	13859	Los Angeles.
7	Webb, Mon L.	Fort Mason, San Francisco, Cal.	13909	San Francisco.
1	*Weide, Frank W.	219 12th St., Milwaukee, Wis.	13731	Chicago.
27	*Whitney, Charles L.	Central Ave., Fort Lee, N. J.	14969	New York.
21	*Williams, Hugh B.	Box 491, Eureka, Cal.	13922	San Francisco.
22	*Wilson, Walter B.	917 N. 47th St., Seattle, Wash.	14146	Seattle.
25	*Wilson, Willard S.	705 Adams St., Wilmington, Del.	13916	Philadelphia ¹
15	Woodcock, William P.	496 W. Ferry St., Buffalo, N. Y.	13736	Buffalo.
15	Wright, Harry E.	1835 Alice St., Oakland, Cal.	13916	San Francisco.
27	Young, John M.	1000 W. 7th St., Los Angeles, Cal.	13960	Los Angeles.

Second grade.

29	Chambers, James.	427 Banks St., San Francisco, Cal.	13224	San Francisco.
25	Cole, Edwin A.	806 S. Dakota St., Tampa, Fla.	12903	Key West, Fla. ¹
13	Cross, Wilbur E.	2872 W. 12th St., Cleveland, Ohio	12350	Cleveland.
13	Dinga, William E.	643 Amsterdam Ave., New York, N. Y.	13825	Brooklyn ¹
28	Dolg, John H., Jr.	3982 1st St., San Diego, Cal.	13283	San Diego.
21	Farmer, Gordon C.	Box 199, Burbank, Cal.	13276	Los Angeles.
15	Fraser, Cyrus H.	48 Glenwood Ave., Buffalo, N. Y.	12387	Buffalo.
14	Garretson, Oliver S.	911 Jane St., Los Angeles, Cal.	13275	Los Angeles.
22	Gleason, George F.	Placentia, Cal.	13277	Do.

* License issued as renewal of expiring license without examination. Otherwise license issued on written examination.

¹ License issued by radio examining officer, Navy Department.

² License issued by radio examining officer, War Department.

Second grade—Continued.

Date.	Licensee.	Address.	Serial No.	Where issued.
27	Hansen, Franklin, jr.....	926 Boston Court, Pasadena, Cal.....	13280	Los Angeles.
5	Hawley, George N.....	344 S. Olive St., Los Angeles, Cal.....	13274	Do.
2	Hayes, Winston E.....	Valparaiso, Ind.....	12345	Chicago.
13	Henney, Julian K.....	10008 Euclid Ave., Cleveland, Ohio.....	12349	Do.
5	Hibbard, Charles H., jr.....	156 Bellefontaine St., Pasadena, Cal.....	13273	Los Angeles.
29	Johnson, F. Kenneth.....	715 East Ave. 43, Los Angeles, Cal.....	13284	Do.
14	Koegel, Carl J.....	253 Bigelow St., Newark, N. J.....	13826	Brooklyn. ¹
3	Kouwenhoven, William.....	Johns Hopkins University, Baltimore, Md.....	12153	Baltimore.
29	Leigh, Philip P.....	814 5th St., Santa Monica, Cal.....	13285	Los Angeles.
2	Liggett, Howard J.....	Virden, Ill.....	12342	Chicago.
28	Marsh, Hallan N.....	1225 W. Brookes Ave., San Diego, Cal.....	13282	Los Angeles.
3	Merritt, Melville B.....	1229 W. Hilton St., Philadelphia, Pa.....	12478	Philadelphia. ¹
15	Moore, Wm. C.....	90 Bedford Ave., Buffalo, N. Y.....	12386	Buffalo.
21	Parker, Clarence A.....	3749 Montrose Ave., Chicago, Ill.....	12390	Chicago.
2	Rohweder, Henry.....	Preston, Iowa.....	12344	Do.
2	Russell, Conrad.....	Valparaiso, Ind.....	12343	Do.
28	Schell, Richard, jr.....	35 Grasmere Ave., Grasmere, N. Y.....	13828	Brooklyn. ¹
25	Seefred, Howard C.....	343 S. Fremont Ave., Los Angeles, Cal.....	13279	Los Angeles.
25	Shelton, R. O.....	3443 5th St., San Diego, Cal.....	13278	San Diego.
28	Space, Wilson.....	3538 5th St., San Diego, Cal.....	13281	Los Angeles.
13	Spencer, John E.....	592 Lake St., Ashtabula, Ohio.....	12348	Cleveland.
27	Spratley, George M.....	636 S. Main St., Sapulpa, Okla.....	12209	New Orleans.
29	Turner, Herbert C.....	1703 S. Berendo St., Los Angeles, Cal.....	13286	Los Angeles.
21	Ulsh, Chester A.....	Valparaiso, Ind.....	12391	Chicago.
16	Ward, Lester J.....	659 Chestnut St., Richmond Hill, N. Y.....	13827	Brooklyn. ¹
13	Werner, Herman E.....	41 Fay St., Akron, Ohio.....	12346	Cleveland.

¹ License issued by radio examining officer, Navy Department.

LETTER OF APPRECIATION FROM THE SECRETARY OF COMMERCE.

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, December 9, 1916.

THE COMMISSIONER OF NAVIGATION:

I beg to express my appreciation of the faithful and unselfish services of the officers and employees of your Bureau during the calendar year now closing and to extend to each and every one of them my cordial wishes for a glad Christmas and a happy and prosperous new year.

Kindly post this letter prominently as it is my earnest desire that all shall see it.

WILLIAM C. REDFIELD,
Secretary.

CHANGES IN RADIO OPERATOR EXAMINATION POINTS.

The examining of radio operators at Fort Monroe, Va., and the Norfolk Navy Yard has been discontinued. Operators desiring to be examined at Norfolk should make application to the radio inspector, Citizens' Bank Building, in that city.

The office of the radio examining officer at Colon, Canal Zone, has been moved to the naval radio station at Darien.

ALASKAN RADIO STATION CLOSED.

The radio station of the Alaska Herring & Sardine Co., at Port Walter, Alaska, closed for the season on December 2 and will reopen for business about March 15, 1917.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, February 1, 1917—No. 26.

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	System.	Wave lengths.	Service.	Hours.
Empire, Oreg. ¹	NZV..	U. S. Army.....	300.....	O	X
Fort Bliss, Tex. ¹	WZO..	do.....	.....	.....	.....
Fort Huachuca, Ariz. ¹	WZP..	do.....	.....	.....	.....

¹ Station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Service.	Hours.
Admiral Sebree ¹	WAG.	.....	300, 600.	.....	.....
Benj. F. Packard ²	WLA.	Kilbourne & Clark, 1,000....	300, 450, 525, 600.	PG	X
Cambridge ³	KGR.	.....	300, 600.....	.....	.....
Capto.....	KWL.	.....	.....	.....	.....
Carl D. Bradley ⁴	WGN.	Marconi.....	300, 600.....	PG	.....
City of Brockton ⁵	KXO.	Nesco.....	300, 600.....	.....	.....
Col. P. S. Michie ⁶	NZU.	U. S. Army.....	200, 300, 425, 600.	O	X
Eagle ⁷	KIR.	Marconi.....	300, 600.....	PG	.....
Firwood ⁸	WSB.	Kilbourne & Clark, 1,000....	300, 450, 525, 600.	PG	N
Freeport Sulphur No. 1 ⁹	KRA.	Marconi, 1,000.....	300, 600.....	PG	X
Freeport Sulphur No. 2 ¹⁰	KRG.	Marconi.....	300, 600.....	PG	.....
Greenwood ¹¹	WLL.	.....	.....	.....	.....
Julia Luckenbach ¹²	KGZ.	.....	300, 600.....	.....	.....
Luckenbach No. 5 ¹³	KEV.	.....	.....	.....	.....
Nokomis ¹⁴	WHD.	Marconi.....	.....	.....	.....
Redwood ⁸	WSD.	Kilbourne & Clark, 1,000....	300, 450, 525, 600.	PG	N
Santa Rosa ¹⁵	WBO.	Marconi.....	300, 600.....	.....	.....
Tiger ⁷	KIT.	do.....	300, 600.....	PG	.....
Van Hogendorp ¹⁶	KVN.	do.....	300, 450, 600.....	PG	.....
Vigo ¹⁷	KMC.	do.....	300, 600.....	PG	.....
W. C. Teagle ¹⁸	KTY.	do.....	300, 600.....	PG	.....
W. F. Burrows ¹⁹	WHG.	Kilbourne & Clark, 1,000....	300, 450, 525, 600.	PG	X
W. F. White ²⁰	WGC.	Marconi.....	300, 600.....	PG	.....

¹ Pacific Alaska Navigation Co., owner of vessel.

² Range 100; rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the Northwestern Fisheries Co., owner of vessel.

³ New York & New Orleans Steamship Co., owner of vessel.

⁴ Rates, 2 c. per word 20 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Bradley Transportation Co., owner of vessel.

⁵ New England Steamship Co., owner of vessel.

⁶ Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C. Government, owner of vessel, seagoing dredge.

⁷ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Standard Transportation Co., owner of vessel.

⁸ Range, 100; rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the Pacific American Fisheries Co., owner of vessel.

⁹ Range, 100; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Freeport Sulphur Transportation Co., owner of vessel.

¹⁰ Freeport Sulphur Transportation Co., owner of vessel.

¹¹ Greenwood Steamship Co., owner of vessel.

¹² Edgar F. Luckenbach, owner of vessel.

¹³ Luckenbach Steamship Co., owner of vessel.

¹⁴ Horace E. Dodge, owner of vessel, yacht.

¹⁵ W. R. Grace & Co., owner of vessel.

¹⁶ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Sarnia Steamship Corp., owner of vessel.

¹⁷ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Junius H. Stone (Transoceanic Steamship Corp.), owner of vessel.

¹⁸ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Standard Oil Co. of N. J., owner of vessel.

¹⁹ Range, 100; rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by Libby, McNeill & Libby Co., owner of vessel.

²⁰ Rates, 2 c. per word 20 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Limestone Transportation Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KEV...	Luckenbach, No. 5.....b	NZV...	Empire, Oreg.....c
KGR...	Cambridge.....b	WAG...	Admiral Seebre.....c
KGZ...	Julia Luckenbach.....b	WBO...	Santa Rosa.....b
KIR...	Eagle.....b	WGC...	W. F. White.....b
KIT...	Tiger.....b	WGN...	Carl D. Bradley.....b
KMC...	Vigo.....b	WHD...	Nokomis.....b
KRA...	Freeport Sulphur No. 1.....b	WHG...	W. F. Burrows.....b
KRG...	Freeport Sulphur No. 2.....b	WLA...	Benj. F. Packard.....b
KTY...	W. C. Teagle.....b	WLL...	Greenwood.....b
KVN...	Van Hogendorp.....b	WSB...	Firwood.....b
KWL...	Capto.....b	WSD...	Redwood.....b
KXO...	City of Brockton.....b	WZO...	Fort Bliss, Tex.....c
NZU...	Col. P. S. Michle.....b	WZP...	Fort Huachuca, Ariz.....c

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

Station.	Call signal.	Wave lengths.	Serv-ice.	Hours.	Station controlled by—
Medford, Mass.....	1XE...	300, 600, vari- able.	P	X	American Radio & Re- search Corp.
Minneapolis, Minn.....	9YP...	200, 425.....	P	X	American Telegraph College.
Rawson Ranch, near Kuna, Idaho.	7ZR...	200, 425.....	P	X	Homer E. Rawson.
Roland Park, Md.....	3XA...	200, 300, 400, 600.	P	X	Louis D. Coriell.
Valley Stream, N. Y.....	2ZL...	200, 300, 425, 600.	P	X	J. Owen Smith.
Woodstock, Ill.....	9ZG...	200, 425.....	P	X	Sydney A. Greenleaf.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XE...	First district: Medford, Mass.	7ZR....	Seventh district: Rawson Ranch, near Kuna, Idaho.
2ZL....	Second district: Valley Stream, N. Y.	9YP...	Ninth district: Minneapolis, Minn.
3ZA....	Third district: Roland Park, Md.	9ZG....	Woodstock, Ill.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc =Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P =Private.

O =Government business exclusively.

Hours =Hours of operation:

N =Continuous service.

X =No regular hours.

m =a. m. (12m=midday).

s =p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

AVALON, CAL.—W. L., 300, 500, 600. Note, Radio station operated and controlled by the Marconi Co. The station communicates only with the steam ferries *Cabrillo* and *Hermosa* and with the station E. San Pedro, Cal.; rates, 2c. per word 20c. minimum per radiogram.

CAPE MAY, N. J.—W. L., 300, 450, 600.

CHICAGO, ILL.—System, Marconi, 1,000; W. L., 300, 450, 600; hours, 1m-11m, 12m-5s, 8s-12s.

DAUNTLESS (WRP).—Strike out all particulars.

DOUGLAS, ARIZ.—Range, 100; W. L., 600, 1650; service, limited commercial.

ENSENADA, P. R.—Range, 150; system, Marconi, 480; hours, week days, 8m-12m, 2s-5s.

FORT YUKON, ALASKA.—Service, PG.

HOLY CROSS, ALASKA.—Hours, receives and transmits at 11m, 3s and 6s on week days, 11m and 6s Sundays and holidays.

JUNEAU, ALASKA.—Note, Radio station operated and controlled by the Marconi Co. The station also communicates with Chichagof; rates as for Jualin, Alaska.

KAUNAKAKAI, ISLAND OF MOLOKAI, HAWAII.—Note, Rates for interisland messages (address and signature counted and charged for), ordinary messages 15c. per word no minimum, press messages 7½c. per word no minimum, cipher or code messages (origin and destination Hawaiian Islands), 25c. per word no minimum, night letters, in plain language only, \$1 for first 24 words 4c. for each additional word. Night letters are not accepted for ships. Messages in other than the English language are charged for at code rate. Double-rush messages are charged for at double rate. Cablegrams or trans-Pacific wireless messages in cipher, code, foreign or English, are accepted and forwarded at ordinary rates plus the forwarding charges of the cable or wireless company when such messages are delivered to them for forwarding.

KAWAIHAE, ISLAND OF HAWAII, HAWAII.—Same note as for Kaunakakai, Island of Molokai, Hawaii.

LAHAINA, ISLAND OF MAUI, HAWAII.—Same note as for Kaunakakai, Island of Molokai, Hawaii.

LIHUE, ISLAND OF KAUAI, HAWAII.—Same note as for as Kaunakakai, Island of Molokai, Hawaii.

SEATTLE, WASH. (KPA).—G. loc., O 122° 20' 00'', N 47° 36' 00''; range 150; W. L., 300, 500, 600, 1650, 2,980. Notes, Radio station operated and controlled by the Marconi Co. The station also communicates with coast stations at Juneau and Ketchikan, Alaska; rates, domestic count, day messages 10 c. per word \$1 minimum per radiogram, night messages 8 c. per word 80 c. minimum per radiogram, night letters 50 words for \$1, 20 c. for each additional 10 words or less, press dispatches 3 c. per word \$1 minimum per radiogram.

WAHIAWA, ISLAND OF OAHU, HAWAII.—Notes, Radio station operated and controlled by the Mutual Telephone Co. (Ltd.). Station conducts special interisland service with Kawaihæ, Lahaina, and Lihue, Hawaii, and communicates with Tutuila and Apia, Samoa. Rates for interisland messages (address and signature counted and charged for) ordinary messages 15 c. per word no minimum, press messages 7½ c. per word no minimum, cipher or code messages (origin and destina-

tion Hawaiian Islands) 25 c. per word no minimum, night letters, in plain language only, \$1 for first 24 words 4 c. for each additional word. Night letters are not accepted for ships. Messages in other than the English language will be charged for at code rate. Double-rush messages will be charged for at double rate. Cablegrams or trans-Pacific wireless messages in cipher, code, foreign or English, will be accepted and forwarded at ordinary rates plus the forwarding charges of the cable or wireless company when such messages are to be delivered to them for forwarding. For messages exchanged with Tutuila, 10 c. per word \$1 minimum per radiogram; for messages exchanged with Apia, 50 c. per word no minimum; for press messages transmitted to ships at sea, 5 c. per word 50 c. minimum per radiogram.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- ALAMO.**—W. L., 300, 450, 600.
AMOLCO.—W. L., 300, 600; service, PG; hours, X; rates, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Boston Molasses Co., owner of vessel.
ANN ARBOR No. 6.—Range, 100; system, Marconi, 480; hours, X.
ATLANTA.—Strike out all particulars.
BRAZOS.—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
BUCCANEER.—Range 150; system, Marconi, 240; service, PG; hours, X.
CALIFORNIA (WOR).—Note, Radio station operated and controlled by the Marconi Co. Harby Steamship Co. (Inc.), owner of vessel.
CITY OF SEATTLE.—Note, Radio station operated and controlled by the Marconi Co. Pacific Coast Co., owner of vessel. Pacific Steamship Co., charterers of vessel.
COMMODORE.—Range, 75; system, Nesco, 1,000; W. L., 300, 600, 820, 925, 1020, 1110, 1200, 1260, 1350; service, P., hours, X. Note, Radio station operated and controlled by the Illinois Naval Battalion, owner of vessel.
EL RIO.—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
FORDONIAN.—System, Marconi; W. L., 300, 600; service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. A. J. Outerbridge, owner of vessel.
FRANCIS HANIFY.—Strike out all particulars.
GOVERNOR FORBES.—Strike out all particulars.
MAINE (KXD).—System, Fessenden, 260; W. L., 300, 550, 600.
MARYLAND.—Strike out all particulars.
MAUI.—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Matson Navigation Co., owner of vessel.
MUNDALE.—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
NACOCHEE.—W. L., 300, 450, 600.
ONEIDA (KYP).—Range, 250; system, Composite, 1,000.
ONEONTA.—System, Kilbourne & Clark, 1,000; W. L., 300, 450, 525, 600. Note, Radio station operated and controlled by the port of Portland, Oreg., owner of vessel.
PAUL JONES (KVV).—Rates, 4 c. per word 40 c. minimum per radiogram.
PENNANT.—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
QUEEN (WGX).—Note, Radio station operated and controlled by the Marconi Co. Pacific Coast Co., owner of vessel. Pacific Steamship Co., charterers of vessel.
SENATOR.—Note, Radio station operated and controlled by the Marconi Co. Pacific Coast Co., owner of vessel. Pacific Steamship Co., charterers of vessel.
SPOKANE.—Note, Radio station operated and controlled by the Marconi Co. Pacific Coast Co., owner of vessel. Pacific Steamship Co., charterers of vessel.
SUNLITE.—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
UMATILLA.—Note, Radio station operated and controlled by the Marconi Co. Pacific Coast Co., owner of vessel. Pacific Steamship Co., charterers of vessel.
VENEZUELA.—Range, 200; system, Marconi, 480; hours, N.

WALLULA.—System, Kilbourne & Clark, 1,000; W. L., 300, 450, 525, 600. Note, Radio station operated and controlled by the port of Portland, Oreg., owner of vessel.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

COLUMBIA, Mo. (9XQ).—Strike out all particulars.

KEY WEST, FLA.—Strike out all particulars.

RAPID CITY, S. DAK. (9XA).—W. L., 425, variable. Radio station operated and controlled by the South Dakota School of Mines.

MISCELLANEOUS.

COMMERCIAL RADIO OPERATORS LICENSED DURING MONTH OF DECEMBER, 1916.

Extra first grade.

Date.	Licensee.	Address.	Serial No.	Where issued. ¹
1	Ingalls, Herbert E.	176 Hickborn St., Revere, Mass.	60	Boston. ²

First grade.

7	*Barbale, Aaron.	1549 44th St., Brooklyn, N. Y.	14984	New York.
7	*Baxter, Joseph H.	274 10th St., Astoria, Oreg.	14751	Seattle.
20	*Beach, Chester L.	215 Clark St., Westfield, N. J.	15006	New York.
13	*Bell, Lloyd E.	803 N. Fulton Ave., Baltimore, Md.	14280	Boston.
12	*Bergman, Lester J.	R. F. D. No. 2, Belmar, N. J.	14997	New York.
18	*Black, William R.	547 E. 87th St., New York, N. Y.	15251	Brooklyn. ¹
27	*Blake, Charles H.	Care Federal Tel. Co., South San Francisco, Cal.	13947	San Francisco.
11	Blankenship, Charles C.	59 Cottage St., Everett, Mass.	14279	Boston.
18	*Bolton, James J.	State Road East, Wayland, Mass.	14285	Do.
12	*Bookmyer, Alvin J.	115 Wilmot St., San Francisco, Cal.	13934	San Francisco.
9	*Boucheron, Pierre H.	20 Fulton St., Maspeth, L. I., N. Y.	14975	New York.
2	*Bourne, Evan F.	Santa Marta, Republic of Colombia.	14989	Do.
26	*Bowers, Albert F.	1946 W. Pratt St., Baltimore, Md.	12210	Baltimore.
2	*Bowman, Orley D.	Fort Monroe, Va.	13592	Fort Monroe. ¹
18	*Boyle, John M.	3228 Mission St., San Francisco, Cal.	138.9	San Francisco.
20	*Breitenbach, Derek S.	Buxton, N. C.	12208	Baltimore.
2	*Bridger, Harley J.	Fort Monroe, Va.	15104	Fort Monroe. ¹
2	*Brook, Terry P.	do.	15102	Do. ¹
14	*Broadhead, Edgar F.	Saville, L. I., N. Y.	15003	New York.
22	*Broussard, Joseph E.	25 Elm St., New York, N. Y.	15008	Do.
12	*Brower, Robert H.	3184 Washington St., San Francisco, Cal.	13931	San Francisco.
29	Bruce, Edmond.	731 Rock Creek Church Road, Washington, D. C.	12018	Washington.
8	*Burch, Joseph A.	S. S. Topila, Galveston, Tex.	14184	New Orleans.
13	*Burgess, George H.	1148 57th St., Brooklyn, N. Y.	14999	New York.
6	*Campbell, Colby D.	2001 Ave I, Galveston, Tex.	14182	New Orleans.
19	*Cannon, Clifford, H.	3047 23d St., San Francisco, Cal.	13941	San Francisco.
11	*Carter, Maurice G.	47 Thanes St., Newport, R. I.	14993	New York.
14	*Cheetham, Henry R.	81 Avon St., Somerville, Mass.	15001	Do.
19	Circeo, Charles J.	22 Battery St., Boston, Mass.	14288	Boston.
8	Cohen, Louis.	71 Hinsdale St., Brooklyn, N. Y.	14935	Brooklyn. ¹
2	*Cole, George E.	624 E. 17th St., Brooklyn, N. Y.	14977	New York.
29	Cole, Jirah D., Jr.	810 Vernon Ave., Glenview, Ill.	13747	Chicago.
8	*Coleman, Arthur.	4 Stone St., New York, N. Y.	14987	New York.
1	*Commager, E.	835 Roosevelt Pl., New Orleans, La.	14987	New Orleans.
18	Cornet, Hermanus J.	303 Main St., Union Hill, N. J.	14944	Brooklyn. ¹
8	*Crittenden, Algernon.	1937 Stillwell Ave., Brooklyn, N. Y.	14985	New York.
8	Crone, Joseph E.	690 Prospect Pl., Brooklyn, N. Y.	14933	Brooklyn. ¹
1	*Cronin, Jeremiah K.	U. S. Naval Radio Station, Norfolk, Va.	12968	Norfolk. ¹
9	*Curtis, Otto E.	84 St. Stephen St., Boston, Mass.	12200	Baltimore.
13	*Dalley, Richard B.	Buxton, N. C.	12204	Do.
11	*Davies, Richard J., Jr.	324 4th St., Union Hill, N. J.	14991	New York.
28	*Davis, William H.	201 W. Franklin St., Baltimore, Md.	12211	Baltimore.
29	Davis, William R.	1409 West Edwards St., Springfield, Ill.	13746	Chicago.

*License issued as renewal of expiring license without examination. Otherwise license issued on written examination.

¹ All licenses issued by radio inspectors of the Department of Commerce unless otherwise indicated.

² License issued by radio examining officer, Navy Department.

³ License issued by radio examining officer, War Department.

MISCELLANEOUS—Continued.

COMMERCIAL RADIO OPERATORS LICENSED DURING MONTH OF
DECEMBER, 1916—continued.

First grade—Continued.

Date.	Licensee.	Address.	Serial No.	Where issued.
13	*De Coste, Daniel J.	90 Lonsdale St., Dorchester, Mass.	14281	Boston.
18	*Dent, Laramie C.	608 S. Dearborn St., Chicago, Ill.	13742	Chicago.
2	De Pretis, John.	Fort Monroe, Va.	13596	Fort Monroe. ¹
11	*Deysher, John P.	Sayville, L. I., N. Y.	14992	New York. ⁴
12	*Dobbins, John S.	R. F. D. No. 2, New Orleans, La.	14187	New Orleans.
4	*Drumney, William J.	424 Broadway, South Boston, Mass.	14274	Boston.
2	Dula, Julius A.	Fort Monroe, Va.	13599	Fort Monroe. ¹
2	Easterbrook, Charles A.	do.	13591	Do. ¹
27	*Eckhardt, John P., Jr.	615 Prospect Pl., Brooklyn, N. Y.	15260	Brooklyn. ²
12	*Eddy, Arlof N.	Block Island, R. I.	12367	Boston. ¹
15	Edmonds, Alonzo.	332 Duke St., Norfolk, Va.	13006	Charleston. ²
8	*Edmonds, Edward J.	Pacific States Hotel, San Francisco, Cal.	13927	San Francisco.
6	Elliott, Fred.	1102 E. Pearl St., Jackson, Mich.	13740	Chicago.
9	*Elliott, Seymour R.	16 Kent St., Cliftondale, Mass.	14278	Boston.
12	*Fagan, Charles L.	Rahway, N. J.	14996	New York.
29	*Fairley, Edward R.	987 Pine St., Oakland, Cal.	13950	San Francisco.
18	Ferrick, William J.	185 Audubon Ave., New York, N. Y.	14947	Brooklyn. ¹
9	Ferris, Malcolm.	3409 Baring St., Philadelphia, Pa.	12917	Philadelphia. ²
15	Fields, James C.	Naval Radio Station, New Orleans, La.	14191	New Orleans.
12	*Filson, Norman W.	29 Barton St., Waltham, Mass.	14282	Boston.
11	*Flottman, John M.	Care Marconi Co., San Francisco, Cal.	13929	San Francisco.
11	Forness, Fred.	Wahiawa, Hawaii.	13310	Pearl Harbor, Hawaii. ²
27	*Friend, William H.	217 W. Clark St., Eureka, Cal.	13948	San Francisco.
4	Fuller, Ray.	Care Tropical Radio Tel. Co., New Orleans, La.	14178	New Orleans.
18	Gaul, Charles.	320 St. Nicholas Ave., New York, N. Y.	14949	Brooklyn. ¹
12	*Giambruno, Waldon P.	1423 Linden St., Oakland, Cal.	13930	San Francisco.
2	Goodwin, James E.	Fort Monroe, Va.	13597	Fort Monroe. ¹
8	Grimnell, Milton W.	55 Buftum St., Salem, Mass.	14275	Boston.
19	Hanley, John E.	2580 Poplar St., New York, N. Y.	15255	Brooklyn. ²
7	Harrigan, John J.	Virginia Beach, Va.	12196	Baltimore.
8	Harte, James W.	1862 N. Uber St., Philadelphia, Pa.	14988	New York.
7	Hartley, Edwin M.	257 Grant St., Cape May, N. J.	12195	Baltimore.
8	*Hatch, Robert I.	1485 Pine St., San Francisco, Cal.	13942	San Francisco.
14	Heiser, Fred D.	Sayville, L. I., N. Y.	15002	New York.
12	*Henderson, George E.	233 S. Pierce St., New Orleans, La.	14185	New Orleans.
12	*Hodges, Sandel A.	2804 Kelsey St., Berkeley, Cal.	13935	San Francisco.
2	Howe, Sidney C.	Fort Monroe, Va.	13598	Fort Monroe. ¹
18	Hughes, William V.	965 Teller Ave., New York, N. Y.	14945	Brooklyn. ¹
12	*Illingworth, F. Harold.	501 E. Forsythe St., Jacksonville, Fla.	12202	Baltimore.
9	Jagers, Homer D.	312 University St., Healdsburg, Cal.	13928	San Francisco.
6	Jensen, Jens.	1101 13th Ave. South, Seattle, Wash.	14150	Seattle.
6	*Jeppesen, Jeppe H.	Slieve, Denmark.	14981	New York.
18	Jewett, Robert C.	607 Eagle Ave., New York, N. Y.	14948	Brooklyn. ¹
7	Johnson, Axel W.	459 E. 135th St., New York, N. Y.	14932	Do. ¹
21	*Jones, Carl L.	Bostick, S. C.	15007	New York.
4	Jones, Edward T.	3999 Dumaine St., New Orleans, La.	14180	New Orleans.
13	*Julien, Ira F.	P. O. Box 43, Astoria, Ore.	14759	Seattle.
14	Kahl, Harry.	967 Sherman Ave., New York, N. Y.	14937	Brooklyn. ²
8	Kallinic, Peter.	312 W. 27th St., New York, N. Y.	14934	Do. ²
19	*Keever, Ross N.	66 Heidt Ave., Oakwood, Mich.	13743	Chicago.
27	*Kennedy, Colin.	2340 West Boulevard, Los Angeles, Cal.	13945	San Francisco.
4	*Kent, William P.	Virginia Beach, Va.	12193	Baltimore.
12	*Lange, August F.	2824 W. Genesee St., Seattle, Wash.	13932	San Francisco.
12	Lawrence, Edwin E.	Naval Radio Station, New Orleans, La.	14188	New Orleans.
27	Leathers, John W.	75 Bay State Ave., Somerville, Mass.	14291	Boston.
11	Leighton, Harold W.	25 Walnut St., Lynn, Mass.	12655	Do. ²
21	*Lewis, James C.	538 Massachusetts Ave., Boston, Mass.	14290	Do.
2	Long, Arthur M.	Fort Monroe, Va.	13595	Fort Monroe. ¹
9	*Lovejoy, Loren A.	535 N. 75th St., Seattle, Wash.	14752	Seattle.
15	Lovett, John A.	30 Bayside Pl., Rockaway Beach, N. Y.	14940	Brooklyn. ²
12	*Lovlee, Raymond P.	Kenneth Hotel, Seattle, Wash.	14754	Seattle.
18	Madden, Francis X.	2391 Davidson Ave., New York, N. Y.	14946	Brooklyn. ²
13	Mahoney, John J.	550 Kappock St., New York, N. Y.	14939	Do. ²
15	*Marriott, John A.	Kensington, Alaska.	14761	Seattle.
12	Mason, Howard F.	2702 31st Ave., South Seattle, Wash.	14755	Do.
1	*Maxson, Charles P.	10 Maxson St., West Mystic, Conn.	14176	New Orleans.
7	*McBride, Karl.	1003 Edmonson Ave., Baltimore, Md.	12194	Baltimore.
4	*McKee, Loyal W.	231 N. Monroe St., Baltimore, Md.	12192	Do.
15	McKee, Russel.	4218 Napier Ave., New York, N. Y.	14942	Brooklyn. ²

* License issued as renewal of expiring license without examination. Otherwise license issued on written examination.

¹ License issued by radio examining officer, War Department.

² License issued by radio examining officer, Navy Department.

MISCELLANEOUS—Continued.

COMMERCIAL RADIO OPERATORS LICENSED DURING MONTH OF
DECEMBER, 1916—continued.

First grade—Continued.

Date.	Licensee.	Address.	Serial No.	Where issued.
27	*McKinnon, John L.	3014 Blanchard St., Los Angeles, Cal.	13946	San Francisco.
27	*McLarney, Thomas A.	Care of United Fruit Co., Bocas del Toro, Panama.	15011	New York.
28	*McQuaid, John F.	L. C. Smith Bldg., Seattle, Wash.	14771	Seattle.
4	McWeeny, John L.	U. S. S. Porter, New York, N. Y.	12654	Boston. ¹
7	*Meekin, William J.	Pier 37, Brooklyn, N. Y.	14982	New York.
2	Messerschmidt, John A.	Fort Monroe, Va.	13594	Fort Monroe. ²
11	Miller, Herbert W.	203 E. 71st St., New York, N. Y.	14936	Brooklyn. ¹
15	Miller, William C.	Naval Radio Station, Tatoosh, Wash.	13204	Tatoosh. ¹
23	*Mohl, Edward O.	920 Taylor St., San Francisco, Cal.	13944	San Francisco.
21	*Morgan, Arthur.	4 Londonderry Rd., Liverpool, Eng.	14289	Boston.
8	*Morris, Maynard C.	601 American Bldg., Baltimore, Md.	12199	Baltimore.
15	*Moulton, Arthur D.	45 Avon St., Wakefield, Mass.	14283	Boston.
13	*Mousley, Franklin.	Palace Hotel, San Francisco, Cal.	13937	San Francisco.
2	Muller, Hans A.	Fort Monroe, Va.	15101	Fort Monroe. ²
14	*Murphy, Francis J.	1526 Sansom St., Philadelphia, Pa.	15005	New York.
2	Murphy, Joseph.	Fort Monroe, Va.	15105	Fort Monroe. ²
21	*Murray, Eugene M.	Haverford, Pa.	12209	Baltimore.
7	*Nelson, Francis A.	Virginia Beach, Va.	12197	Do.
26	*Nichols, Edwin A.	2889 W. 12th St., Cleveland, Ohio.	13744	Chicago.
8	*Nicholls, George W.	9 Wolcott St., Malden, Mass.	14276	Boston.
12	*Nichols, Clifton T.	2152 San Antonio Ave., Alameda, Cal.	13933	San Francisco.
18	Northrop, William T.	Grant Ave., Bronx, New York, N. Y.	15252	Brooklyn. ¹
2	Oldham, David C.	Fort Monroe, Va.	13593	Fort Monroe. ²
12	*O'Neill, John H.	1643 47th Ave., San Francisco, Cal.	13936	San Francisco.
28	*Ormiston, Kenneth G.	San Francisco, Cal.	13949	Do.
9	O'Stein, William W.	Newbern, N. C.	12969	Norfolk. ¹
4	*Ott, George A.	U. S. S. Pamlico, Newbern, N. C.	15151	Do.
4	*Pannill, Charles J.	Radio, Va.	12017	Washington.
11	*Pearse, William C.	505 W. 111th St., New York, N. Y.	14994	New York.
7	Perry, Joseph O.	784 Garfield St., Appleton, Wis.	13361	Darien, C. Z. ¹
21	Peterson, Frank E.	2615 Virginia St., Berkeley, Cal.	13943	San Francisco.
2	Pistelok, Frederick J.	Fort Monroe, Va.	15103	Fort Monroe. ²
29	Prenzel, Elmer.	718 S. 14th St., Sheboygan, Wis.	13745	Chicago.
6	*Quigley, Edward I.	Pier 47, North River, New York, N. Y.	14980	New York.
12	*Randow, Albert H.	Philadelphia, Pa.	12201	Baltimore.
19	Ray, John W.	151 Smart Ave., Flushing, L. I., N. Y.	15258	Brooklyn. ¹
12	*Rehbein, Arthur H. F.	163 E. 4th St., Brooklyn, N. Y.	14998	New York.
8	*Ridley, Arthur E.	South Hanson, Mass.	14277	Boston.
13	Rodan, Cornelius F.	U. S. Naval Radio Station, New Orleans, La.	14189	New Orleans.
15	*Rodebaugh, Herbert M.	Chestnut Hill, Philadelphia, Pa.	12206	Baltimore.
7	Satome, Frederic W.	1493 Harrison St., Oakland, Cal.	13926	San Francisco.
12	*Savage, Reginald S.	Care of Marconi Co., New York, N. Y.	14995	New York.
7	Sazer, Maurice L.	1019 Perdido St., New Orleans, La.	14183	New Orleans.
15	Schwartz, Frederick.	128 W. 112th St., New York, N. Y.	14941	Brooklyn. ¹
2	Seemann, Robert.	Fort Monroe, Va.	13600	Fort Monroe. ²
15	Sellers, James H.	Care Tropical Radio Tel. Co., New Orleans, La.	14190	New Orleans.
13	*Shallercross, Howard W.	West Cape May, N. J.	12203	Baltimore.
2	Shatto, Alva E.	Fort Monroe, Va.	15106	Fort Monroe. ²
16	*Shaw, Frank W.	1366 Green St., San Francisco, Cal.	13938	San Francisco.
28	Shorey, Gustavus F.	249 Grove St., Melrose, Mass.	14292	Boston.
4	Smith, Alan P., 3d.	18 E. Madison St., Baltimore, Md.	12207	Baltimore.
15	*Smith, Robert G.	Swan Island	14179	New Orleans.
5	Stairley, Benjamin F.	Naval Radio Station, New Orleans, La.	14181	Do.
18	*Stevens, Thomas M.	Merchants Exchange Bldg., San Francisco, Cal.	13940	San Francisco.
8	*Stewart, Charles H.	St. David's, Pa.	12198	Baltimore.
19	*Tierney, Matthew C.	Siasconset, Mass.	14287	Boston.
18	Tilley, Henry H.	5 Dartmouth St., Newport, R. I.	14286	Do.
12	Trevatt, Charles F.	L. C. Smith Bldg., Seattle, Wash.	14753	Seattle.
19	Upham, Henry.	1829 Bathgate Ave., New York, N. Y.	15256	Brooklyn. ¹
12	*Vermilya, Irving.	South Wellfleet, Mass.	12636	Boston. ¹
14	*Vogel, Wm. F.	1219 William St., Baltimore, Md.	12205	Baltimore.
2	Vosburgh, Charles P.	4328 Richardson Ave., New York, N. Y.	14943	Brooklyn. ¹
15	*Vosburgh, Ross J.	322 Lincoln Rd., Brooklyn, N. Y.	14976	New York.
18	*Wampler, Edward V.	Lynden, Wash.	14758	Seattle.
14	Ward, James J.	522 W. 182d St., New York, N. Y.	14938	Brooklyn. ¹
7	Ward, John F.	do.	14950	Do. ¹
8	*Weaver, Charles J.	1016 E. 13th St., Brooklyn, N. Y.	14983	New York.

* License issued as renewal of expiring license without examination. Otherwise license issued on written examination.

¹ License issued by radio examining officer, Navy Department.

² License issued by radio examining officer, War Department.

MISCELLANEOUS—Continued.

COMMERCIAL RADIO OPERATORS LICENSED DURING MONTH OF
DECEMBER, 1916—continued.

First grade—Continued.

Date.	Licenses.	Address.	Serial No.	Where issued.
7	*White, Chester C. ¹	554 Brunswick St., San Francisco, Cal.....	13908	San Francisco.
1	Whit, Otto H.....	76 Woodward Ave., San Francisco, Cal.....	13925	Do.
14	*Wiltse, George V.....	Hotel Delta, Seattle, Wash.....	14756	Seattle.
13	*Woods, R.....	118 Johns St., Seattle, Wash.....	14757	Do.
9	Worrell, Richard A.....	Sussex St., Larchmont, Norfolk, Va.....	12970	Norfolk. ²
2	*Wright, Marshall C.....	569 West End Ave., New York, N. Y.....	14978	New York.
12	*Young, Robert I.....	1421 Arch St., West Tampa, Fla.....	14186	New Orleans.
10	*Yuter, Abe I.....	715 Tremont Ave., New York, N. Y.....	14990	New York.

Second grade.

29	Agnoli, Justus J.....	16 Purvis St., Long Island City, N. Y.....	12836	Brooklyn. ²
19	Cardosa, James G.....	Campbel St., Oakland, Cal.....	13225	San Francisco.
17	Clarkin, William.....	2416 Morris Ave., New York, N. Y.....	13835	Brooklyn. ²
26	Donohue, Peter J.....	137 W. 60th St., New York, N. Y.....	13832	Do. ²
27	Downing, Joseph F.....	353 W. 57th St., New York, N. Y.....	13833	Do. ²
29	Fitzpatrick, George W.....	3245 Ferdinand St., Seattle, Wash.....	12276	Seattle.
16	Gillen, William H.....	407 W. 23d St., New York, N. Y.....	12104	New York.
7	Hicks, Thomas R.....	318 W. 57th St., New York, N. Y.....	13831	Brooklyn. ²
4	Hotchkiss, Raymond S.....	U. S. S. Porter, New York, N. Y.....	12422	Boston. ²
29	Krog, Albert.....	Valparaiso, Ind.....	12393	Chicago.
7	May, Fred.....	143 High St., Montclair, N. J.....	13829	Brooklyn. ²
5	McKee, Stuart S.....	New Orleans, La.....	12210	New Orleans.
27	Mosher, Robert B.....	236 W. 83d St., New York, N. Y.....	13834	Brooklyn. ²
26	Pennypacker, Thomas R.....	St. George's School, Newport, R. I.....	12073	Boston.
1	Peterson, Robert M.....	3 Blodgett Pl., Worcester, Mass.....	12072	Do.
7	Roy, James A.....	303 Orange Rd., Montclair, N. J.....	13830	Brooklyn. ²
23	Swenson, Joseph.....	7852 Ashworth Ave., Seattle, Wash.....	12275	Seattle.
1	White, Elliott A.....	634 Hinman Ave., Evanston, Ill.....	12392	Chicago.

*License issued as renewal of expiring license without examination. Otherwise license issued on written examination.

¹ License issued in November; particulars received at bureau too late for publication in November list.

² License issued by radio examining officer, Navy Department.

UNUSUAL SOURCE OF AUXILIARY POWER SUPPLY.

The following is an extract from the report of Radio Operator Willard Ferris, of the steamship *Carolina* of the Goodrich Transit Co., which met with an accident on December 3, 1916, running aground on Stony Creek Reef and springing several plates. The vessel is voluntarily equipped with radio apparatus and is not supplied with an auxiliary source of power supply:

The power went off at 7 p. m., and the Manitowoc station called at frequent intervals until 10 p. m., and from that time until 11 p. m. the Ludington and Milwaukee stations called, but I was unable to answer them, as there was no power. About 11 o'clock, with the permission of the captain and the assistance of some of the crew, I removed the storage batteries from the six automobiles which were on board.

I wired these batteries in series, obtaining a total voltage of 36. The transmitter was of the one-half kilowatt, 120 cycle, panel type, and by adjusting the rheostats for full power and using six plates in the quenched gap a reading of one-fourth ampere on the hot-wire ammeter was obtained and communication was established with Ludington, a distance of about 75 miles.

It was necessary to short circuit the automatic starter, as there was not enough power to raise the solenoid, and to substitute a wire for the generator field switch, in order to disconnect the motor running the quenched-gap blower and save all the power for the operation of the motor generator. The batteries were restored to the automobiles the following afternoon when the cars were placed aboard a relief vessel.

ALASKAN RADIO STATIONS CLOSED.

The radio stations at Alockanok River and Clarks Point, Alaska, and the permanently moored schooner *Metha Nelson*, located at Bristol Bay, Alaska, have been closed for the season and will reopen about March, 1917.

CHANGE IN SERVICE OF NOME RADIO STATION.

The continuous service maintained by the Signal Corps station at Nome, Alaska, has been discontinued and will be resumed on June 1, 1917. The present hours of operation are from 8 a. m. to 9 p. m. on week days, and 8 a. m. until clear and 4 p. m. until clear on Sundays and holidays.

CHANGES IN FRENCH RADIO STATIONS.

The Bureau is in receipt of information from the Director of the International Radiotelegraphic Bureau at Berne, Switzerland, that he has been advised by the Minister of French Colonies that the land station at Tabou, Occidental French Africa, has again been opened to service and that the operation of the land station at Monrovia, Liberia (FMA), has been suspended.

PROPOSED TELEGRAPH LINES, RADIO STATION, AND CODE IN PERU.

Measures have been adopted by the Peruvian Government authorizing the construction of a telegraph line between the cities of Ica and Castrovirreyna, at a cost of 6,300 Peruvian pounds (\$30,659), and the installation of wireless stations at various points in the basin of the Amazon, at a cost of 10,000 Peruvian pounds (\$48,665). El Peruano also notes that a new telegraphic code has been compiled by the Department of Telegraphs and Mails, and a commission of Government officials has been appointed to examine the code and to make a recommendation as to its adoption.

NEW RADIO STATION IN BOLIVIA.

A new radio station has recently been erected at Viacha near La Paz. The West Coast Leader says that commercial service was established October 20 between the Bolivian station and the Lima wireless station at San Cristobal.

MARINE DISASTERS IN WHICH WIRELESS FIGURED DURING THE PERIOD
JULY 1 TO DECEMBER 31, 1916.

July 11.—Steamship *Ramos* foundered in a gale while en route from Philadelphia to Cartagena, Colombia. SOS calls were answered by the Miami land station and the steamships *Van Hogendorp* and *Illinois*, all but five persons on board being saved.

July 22.—Steamship *Matatua*, stranded on rocks 7 miles south of St. Mary's Light, Cape Race. Vessel shot line to shore, and passengers and crew were removed. The distress call was answered by the steamship *Stephano*, Red Cross Line, which stood by until passengers were safely removed.

September 15.—Steamship *Congress*, with 445 persons on board, caught fire off Coos Bay, Marshfield, Oreg. The vessel was headed toward shore. SOS calls being sent out continuously, which were received by the land stations at Marshfield, Oreg., Cape Blanco, Oreg., and Eureka, Cal., and the steamship *F. A. Kilburn*. Rescue vessels were dispatched by the Marshfield station, and all persons on board were saved.

September 23.—Steamship *Bay State* ran ashore off Cape Elizabeth, Me.; total loss. Distress calls were answered by the Coast Guard cutter *Ossippe* and the naval station at Cape Elizabeth, which dispatched the tugs *Portland* and *Cumberland*. All persons on board, approximately 200 in number, were saved.

October 7.—Steamship *Antilla*, with 56 persons aboard, caught fire off the Virginia Capes while en route from Guantanamo, Cuba, to New York. Approximately 25 vessels responded to the distress calls, and all persons were saved.

October 19.—Steamship *Arapahoe* lost her rudder 25 miles north of Cape Lookout. SOS calls were answered by the steamship *Henry R. Mallory* and the Coast Guard cutters *Seminole* and *Tampa*, which towed the vessel to Norfolk.

October 28.—Steamship *Chicago*, with 265 passengers and crew, caught fire at sea and arrived safely at the Azores Islands. Communication was established with vessels, but assistance was not needed.

October 29.—Tug *Vigilant* disabled 150 miles off Irish coast. SOS call answered by the steamship *Ryndam*, which towed the tug to Queenstown.

November 25.—Steamship *Powhatan*, en route from Boston to Baltimore, caught fire off Block Island. Fire was controlled before arrival of Coast Guard cutters, which answered the distress call.

November 27.—Steamship *Niels Nielson* lost propeller in heavy gale. Distress calls were answered by several vessels, which assisted the disabled vessel to make port.

November 28.—Steamship *Coronado* lost propeller off Tillamook Head. Distress calls answered by Astoria, Oreg., station, which dispatched tug to assistance of disabled vessel.

December 5.—Steamship *Carolina*, Goodrich Transit Co., struck rocks off entrance to Sturgeon Bay Canal. Distress calls were received by the Manitowoc, Wis., station, which dispatched a tug to the assistance of the disabled vessel.

December 12.—Steamship *Sumner* grounded in fog off Barnegat, N. J. Six vessels responded to SOS calls, and all persons on board were saved.

December 14.—Steamship *Powhatan*, en route from Norfolk to Boston, sank in collision with unknown vessel on way to open sea. Several United States destroyers, Coast Guard cutters, and steamship *Jamestown* answered SOS calls. Crew transferred to Coast Guard vessels and passengers were taken to New York on the steamship *Jamestown*.

December 25.—Steamship *Maryland* sank at sea, position as given in SOS call 380 miles east of Sandy Hook, with crew of 34. Distress calls answered by several Coast Guard cutters, but they were unable to locate the disabled vessel.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, March 1, 1917—No. 27.

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	System.	Wave lengths.	Service.	Hours.
Great Falls, Mont. ¹	O 111 10 00 N 47 35 00	KLQ....	Composite, 200....	1700	(*)	X
Isabela de Basilan, P. I. ²		KHI....				8m-5.20s
Kvichak, Alaska ³	O 156 48 00 N 59 03 00	KHB....	Kilbourne & Clark.	300, 400, 500, 600	(*)	X
Philadelphia, Pa. ⁴	O 75 09 44 N 39 57 06	WHE....	Marconi, 240.....	1650	(*)	9m-5s

* Limited commercial.

¹ Station operated and controlled by the Great Falls Power Co., Butte, Mont. The station is limited to communication with Butte, Thompson Falls, and Lewistown, Mont.

² Station operated and controlled by Philippine insular government, Washington, D. C.

³ Range, 125. Station operated and controlled by Alaska Packers' Association. The station is limited to communication with the stations of the Alaska Packers' Association at Naknek, Sang Point, and Clarks Point, Alaska, and vessels of the association. The station is in operation from April to October of each year.

⁴ Range, 400. Station operated and controlled by John Wanamaker. The station is operated in conjunction with Marconi's Philadelphia station, but is limited to communication with a station at New York, N. Y. (WHI).

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Service.	Hours.
Admiral Wainwright ¹	WSF		300, 600		
Astoria ²	WRL	Kilbourne & Clark, 1,000.	300, 450, 525, 600.	PG	N
Astri ³	WRN	do.....	300, 450, 525, 600.	PG	N
Charles O. Jenkins ⁴	WFT	Marconi.....	300, 600	PG	
Druid ⁵	KYK	do.....	300, 600	PG	
F. B. Squire ⁴	WFO	do.....	300, 600	PG	
Holden Evans ⁶	KMY	Marconi, 1,000.....	300, 450, 600	PG	X
Ituna ⁷	WPA	Halcun.....			
John Scully ⁸	KVT	Marconi.....	300, 600	PG	
Margaret ²	WRQ	Kilbourne & Clark, 1,000.	300, 450, 525, 600.	PG	N
Mary ²	WRM	do.....	300, 450, 525, 600.	PG	N
May ³	WRR	do.....	300, 450, 525, 600.	PG	N
Orleans ⁹	KRZ				
Sagua ¹⁰	KVO	Marconi.....	300, 600	PG	
Santa Maria ¹¹	KWU	do.....	300, 600	PG	
Sherman ¹²	KMQ	Marconi, 1,000.....	300, 450, 600	PG	X
Sir Thomas Shaughnessy ⁴	WFO	Marconi.....	300, 600	PG	
Southerner ¹³	KJH	do.....	300, 600	PG	
United States ¹⁴	KZU	do.....			

¹ Pacific Steamship Co., owner of vessel.

² Range, 100; rates, 4c. per word 40c. minimum per radiogram. Radio station operated and controlled by the McEachern Ship Co., owner of vessel.

³ Range, 100; rates, 4c. per word 40c. minimum per radiogram. Radio station operated and controlled by A. O. Andersen & Co., owner of vessel.

⁴ Rates, 2c. per word 20c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Jenkins Steamship Co., owner of vessel.

⁵ Rates, 4c. per word 40c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Rodman Wanamaker, owner of vessel, yacht.

⁶ Range, 150; rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Bulk Oil Transports (Inc.), owner of vessel.

⁷ Mexican Navigation & Commercial Co., owner of vessel.

⁸ Rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Scully Line, Inc., owner of vessel.

⁹ Oriental Navigation Corp., owner of vessel.

¹⁰ Radio station operated and controlled by the Marconi Co. Siberia Steamship Co., owner of vessel.

¹¹ Rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Sun Co., owner of vessel.

¹² Range, 250; rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Chile Exploration Co., owner of vessel.

¹³ Rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Southland Steamship Co., owner of vessel.

¹⁴ Rates, 4c. per word 40c. minimum per radiogram. Radio station operated and controlled by E. H. R. Green, owner of vessel, yacht.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KHB	Kvichak, Alaska.....c	WFT	Charles O. Jenkins.....b
KHI	Isabela de Basilan, P. I.....c	WFU	F. B. Squire.....b
KJH	Southerner.....c	WFO	Sir Thomas Shaughnessy.....b
KIQ	Great Falls, Mont.....c	WHE	Philadelphia, Pa.....c
KMQ	Sherman.....b	WPA	Ituna.....b
KMZ	Holden Evans.....b	WRL	Astoria.....b
KVZ	Orleans.....b	WRM	Mary.....b
KVO	Sagua.....b	WRN	Astri.....b
KVT	John Scully.....b	WRQ	Margaret.....b
KWU	Santa Maria.....b	WRR	May.....b
KYK	Druid.....b	WSF	Admiral Wainwright.....b
KZU	United States.....b		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Big Creek, Cal.....	6XV	200, 425.....	P	X	Walter Burnett and Oscar Kipl.
Chicago, Ill.....	9XG	300, 600, variable..	P	X	Austin A. Howard.
Culver, Ind.....	9YN	Variable.....	P	X	Culver Military Academy.
Decatur, Ill.....	9YJ	200, 425.....	P	X	James Millikin University.
Enterprise, Oreg.....	7ZH	200, 425.....	P	X	Orland M. Heacock.
Eureka, Ill.....	9YQ	420.....	P	X	Eureka College.
Greeley, Colo.....	9YZ	200, 600.....	P	X	State Teachers' College.
Grove City, Pa.....	8YV	200, 425, 1000.....	P	X	Grove City College.
Kansas City, Mo.....	9ZK	200, 425.....	P	X	Albert I. Graham.
Phoenix, Ariz.....	6ZP	200, 425.....	P	X	Harry K. Behn, Jr.
Red Bluff, Cal.....	6ZS	200, 425.....	P	X	Herbert G. Strain.
Springfield, Mass.....	12K	200, 425.....	P	X	Glenn C. Sabin.
Springfield, Ohio.....	8ZQ	200, 425.....	P	X	Charles K. Brain.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
12K	First district: Springfield, Mass.	9XG	Ninth district: Chicago, Ill.
6XV	Sixth district: Big Creek, Cal.	9YJ	Decatur, Ill.
6ZP	Phoenix, Ariz.	9YN	Culver, Ind.
6ZS	Red Bluff, Cal.	9YQ	Eureka, Ill.
7ZH	Seventh district: Enterprise, Oreg.	9YZ	Greeley, Colo.
8YV	Eighth district: Grove City, Pa.	9ZK	Kansas City, Mo.
8ZQ	Springfield, Ohio.		

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude, S=south latitude.

Call =Call letters assigned.

System =Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P =Private.

O =Government business exclusively.

Hours =Hours of operation:

N =Continuous service.

X =No regular hours.

m =a. m. (12m=midday).

s =p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ENSENADA, P. R.—Service, PG; hours, week days 8m–12m, 2s–5s, Sundays 9m–12m, 7s–8s. Note, Radio station operated and controlled by the Guanica Centrale. The station also communicates with stations at Santo Domingo City and La Romana (Dominican Republic), rate, 12c. per word no minimum.

GREAT LAKES, ILL.—W. L., 300, 600, 1000; service, PG; rates, 6c. per word 60c. minimum per radiogram.

KING COVE, ALASKA.—G. loc. (approximate), O 162° 20' 00'', N 55° 05' 00''; range, 200; system, Kilbourne & Clark, 1,000; W. L., 300, 600, 1610, 2000; service, PG and limited commercial; hours, 8.30m–12m, 1s–5s, and at other hours when business warrants, 6c. per word 60c. minimum per radiogram. Note, Radio station operated and controlled by the Pacific-American Fisheries Co. The station also communicates with stations at Akutan, Clarks Point, Hales Creek, Larsen Bay, Port Moller, Snag Point, Alockanock River, Latouche, Chignik, Nushagak, Naknek, Cordova, Ugashik, Kvichak, and Egegak, Alaska, rate 6c. per word 60c. minimum per radiogram, domestic count; night messages 75 per cent of day rate; night letters 60c. per 50 words 12c. for each additional 10 words or fraction thereof, domestic count.

KOGGIUNG, ALASKA.—Strike out all particulars.

MIAMI, FLA.—W. L., 300, 450, 600. Note, Radio station operated and controlled by the Marconi Co.

PASSAGRILLE, FLA.—Strike out all particulars.

PHILADELPHIA, PA. (WHE).—W. L., 300, 600; service, PG; hours, 9m–5s. Note, Radio station operated and controlled by the Marconi Co.

ST. PETERSBURG, FLA.—Strike out all particulars.

TUTUILA, SAMOA.—G. loc. (approximate) O 171° 00' 00'', S 14° 00' 00''; system, U. S. Navy; W. L., 600, 750; service, PG; hours, N; rate, 6c. per word, 60c. minimum per radiogram. Note, Radio station operated and controlled by the United States Naval Communication Service, Radio, Va. The station communicates with stations at Apia (Samoa), Suva (Fiji Islands), Tahiti Island, and Wahiawa (Hawaii), rate 6c. per word no minimum.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- ALLIANCE.**—Note, Radio station operated and controlled by the Marconi Co. Fair & Moran, owner of vessel.
- BEAVER (WVB).**—System, Marconi, 400.
- CAPTO.**—Strike out all particulars.
- CARLOS.**—Strike out all particulars.
- CASIANA.**—Range, 150; system, Marconi, 1,000; W. L., 300, 600; service, PG; hours, X, rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Edward L. Doheny, owner of vessel, yacht.
- DORCHESTER.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. minimum per radiogram.
- FREEPORT SULPHUR No. 2.**—Service, PG; rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Freeport Sulphur Transportation Co., owner of vessel.
- GRACE DOLLAR.**—Strike out all particulars.
- HARRY LUCKENBACH.**—Note, Radio station operated and controlled by the Marconi Co. Luckenbach Co. (Inc.), owner of vessel.
- H. C. FOLGER.**—Range, 250; system, Marconi, 1,000; W. L., 300, 450, 600.
- JULIA LUCKENBACH.**—Range, 250; system, Kilbourne & Clark, 1,000; W. L., 300, 450, 525, 600; service, PG, hours, X; rates, 8c. per word 80c. minimum per radiogram. Note, Radio station operated and controlled by the Luckenbach Steamship Co. (Inc.), owner of vessel.
- KLAMATH.**—System, Marconi, 240; rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. minimum per radiogram.
- LUCKENBACH No. 3.**—Range, 150; system, Kilbourne & Clark, 1,000; W. L., 300, 450, 600; service, PG, hours, X; rates, 4c. per word 40c. minimum per radiogram. Note, Radio station operated and controlled by Edgar F. Luckenbach, owner of vessel, tug.
- LUCKENBACH No. 5.**—Range, 150; system, Kilbourne & Clark, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, 4c. per word 40c. minimum per radiogram. Note, Radio station operated and controlled by the Luckenbach Steamship Co. (Inc.), owner of vessel.
- NEWPORT (WWH).**—Rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. minimum per radiogram.
- NIRVANA.**—Strike out all particulars.
- NOKOMIS (WHD).**—W. L., 300, 600; service, PG; rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. per radiogram. Note, Radio station operated and controlled by the Marconi Co. Horace E. Dodge, owner of vessel, yacht.
- PANUCO (KWM).**—Range, 250; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
- POWATAN (KQY).**—Strike out all particulars.
- PRESIDENT.**—Range, 150; system, Marconi, 400. Note, Radio station operated and controlled by the Marconi Co. Pacific Steamship Co., owner of vessel.
- PROVIDENCIA.**—System, Halcun, 700; rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. minimum per radiogram. Note, Radio station operated and controlled by the Providencia Steamer Co., owner of vessel.
- ROCHESTER.**—Note, Radio station operated and controlled by the Marconi Co. Rochester Navigation Corp., owner of vessel.
- SANTA ANA.**—Hours, X.
- SANTA MARIA (WTF).**—Strike out all particulars.
- SANTA ROSA.**—Service, PG; rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service 8c. per word 80c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. W. R. Grace & Co., owner of vessel.
- SPEEDWELL.**—Strike out all particulars.
- WILLAMETTE.**—Range, 100; system, Marconi, 240.

WM. G. WARDEN.—Range, 250; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.

YOSEMITE.—Hours, X. Note, Radio station operated and controlled by the Marconi Co. Puget Sound Commercial Co. (Inc.), owner of vessel.

YUCATAN.—Strike out all particulars.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

LA GRANDE, OREG.—Strike out all particulars.

MINNEAPOLIS, MINN. (9ZE).—Call, 9XF; W. L., variable.

NORTHAMPTON, MASS.—Strike out all particulars.

PHILADELPHIA, PA. (3ZO).—Strike out all particulars.

ST. LOUIS, MO. (9XC).—Strike out all particulars.

SPRINGFIELD, ILL.—W. L., 1750.

MISCELLANEOUS.

COMMERCIAL RADIO OPERATORS LICENSED DURING MONTH OF JANUARY, 1917.

Extra first grade.

Date.	Licensee.	Address.	Serial No.	Where issued. ¹
18	*Lovejoy, Edwin Wm.....	1818 Magnolia Ave., Los Angeles, Cal.	61	Washington.

First grade.

2	*Allen, George H.....	16 Bacon St., Waltham, Mass.....	15012	New York.
10	Allen, Herbert R.....	8 S. Durham, Brooklyn, N. Y.....	15269	Brooklyn. ¹
22	*Armstrong, Roy E.....	130 Lakeshore Drive, Port Arthur, Tex.	14196	New Orleans.
2	*Arnold, Eric W.....	Hewitt, N. J.....	15014	New York.
12	Ashmore, J. Wilmer.....	3408 Hamilton St., Philadelphia, Pa.	12919	Philadelphia. ¹
6	Azoy, Geoffrey V.....	28 S. Maple Ave., East Orange, N. J.	15267	Brooklyn. ¹
12	Barker, Julian D.....	19 Channing St., Newport, R. I.....	14300	Boston.
5	*Bassett, Joseph M.....	423 W. 22d St., New York, N. Y.....	15019	New York.
15	Batchelder, Hugh McL.....	92 Lake Ave., Melrose, Mass.....	14304	Boston.
3	*Bernstwiller, Arthur C.....	Univ. of Penna., Philadelphia, Pa.	15015	New York.
22	*Biesemeyer, Walter H.....	6th and Washington Sts., Manitowoc, Wis.	13751	Chicago.
11	*Blsgrove, William E.....	25 Elm St., New York, N. Y.....	15022	New York.
11	*Blangenburg, Adolph.....	294 Manahan St., Brooklyn, N. Y.....	15024	Do.
23	Blumberg, Ernest R.*.....	Clifton, Tex.....	14913	Brooklyn. ¹
2	*Bonduaux, Lucien E.....	924 E. 169th St., New York, N. Y.....	15261	Do. ¹
7	*Bromley, Arthur C.....	Latouche, Alaska.....	14769	Seattle.
4	*Buchanan, J. A.....	2108 L. C. Smith Bldg., Seattle, Wash.	14763	Do.
23	Burke, Alan W.....	40 Pollock Ave., Pittsfield, Mass.....	14308	Boston.
26	*Callahan, Francis J.....	Care Federal Telegraph Co., San Francisco, Cal.	13888	San Francisco.
19	*Cassells, Paul E.....	S. S. Jos. R. Parrott, Key West, Fla.	13256	Key West. ¹
5	Cerio, Thomas.....	25 W. 125th St., New York, N. Y.....	15266	Brooklyn. ¹
4	*Cissenfeld, Samuel.....	611 S. Charles St., Baltimore, Md.....	12314	Baltimore.
15	*Colby, Edward B.....	132 Dodge St., Beverly, Mass.....	14303	Boston.
12	*Cowden, John.....	Siasconset, Mass.....	14298	Do.
5	*Cowden, Reuel E.....	Juneau, Alaska.....	13873	San Francisco.
30	Cox, James H.....	631 Capitol St., Vallejo, Cal.....	13104	Mare Island. ¹
12	*Darlington, Edgar T.....	325 Budd St., Philadelphia, Pa.....	15025	New York.
30	Dean, Samuel W.....	4 Elliot Rd., Lexington, Mass.....	14314	Boston.
11	*du Treil, L. J. N.....	Galveston, Tex.....	14195	New Orleans.
17	Farrington, Bruce B.....	1117 Morton St., Alameda, Cal.....	13883	San Francisco.
7	*Ferson, Oliver S.....	Box 55, Miami, Fla.....	13255	Key West. ¹
14	*Froberger, Laurence G.....	310 W. 26th St., New York, N. Y.....	15017	New York.
18	Gardell, Emil C.....	Oakhurst, N. J.....	15273	Brooklyn. ¹
17	*Gardner, Arthur R.....	Pocasset, Mass.....	14306	Boston.

* License issued as renewal of expiring license without examination. Otherwise license issued on written examination.

¹ All licenses issued by radio inspectors of the Department of Commerce unless otherwise indicated.

² License issued by radio examining officer, Navy Department.

³ License issued in December; particulars received at Bureau too late for publication in December list.

First grade—Continued.

Date.	Licensee.	Address.	Serial No.	Where issued.
31	*Gaugh, Harry E.	U. S. Coast Guard Cutter Manning, San Francisco, Cal.	13889	San Francisco.
3	*Gittings, Donald S.	1852 W. 49th St., Los Angeles, Cal.	13872	Do.
16	Goldsmith, Philip H.	12 W. 77th St., New York, N. Y.	15273	Brooklyn. ¹
12	Goularte, Mannel L.	Fairhaven, Mass.	14297	Boston.
3	*Graf, Herman, Jr.	Averles, Md.	12213	Baltimore.
23	*Grantlin, William P.	U. S. S. Cyclops, New York, N. Y.	12216	Do.
10	*Gussman, Allan P.	1024 Franklin St., San Francisco, Cal.	15021	New York.
23	*Hamilton, Geo. F.	108 Pine St., Millville, N. J.	15029	Do.
22	*Hewlett, Palmer B.	Hollister, Cal.	13884	San Francisco.
12	*Holden, Harry H.	Siasconset, Mass.	14299	Boston.
2	*Hopper, Horace G.	1719 W. Lexington St., Baltimore, Md.	12212	Baltimore.
12	*Jackson, Arthur E.	8909 Kanmore Ave., Cleveland, Ohio	13741	Chicago.
15	Jankins, Lester I.	74 Smith St., New Bedford, Mass.	14302	Boston.
30	Jennings, John W.	Lake Mahopac, N. Y.	15278	Brooklyn. ¹
25	Johnson, Thurston A.	123 Winthrop St., Winthrop, Mass.	14309	Boston.
9	*Johnstone, Richard	821 Shrader St., San Francisco, Cal.	13877	San Francisco.
20	*Keever, Joseph W.	1620 48th Ave., San Francisco, Cal.	13885	Do.
29	*Kelland, Wesley F.	1716 N. Calvert St., Baltimore, Md.	12218	Baltimore.
29	Kleinberger, Richard C.	100 Vanderbilt Ave., Stapleton, N. Y.	15276	Brooklyn. ¹
3	*Knerlman, Joseph	Atco, N. J.	12918	Philadelphia. ¹
25	Kraft, Edwin A.	5241 11th Ave., N. E., Seattle, Wash.	14777	Seattle.
25	Krog, Albert	649 Poplar St., Poplar Bluff, Mo.	13732	Chicago.
19	Lamb, Edwin S.	Ketchikan, Alaska.	14774	Seattle.
30	*Leonard, S. Edwin	10703 Hull Ave., Cleveland, Ohio.	15255	Chicago.
3	*Lopes, Anthony	64 E. 105th St., New York, N. Y.	15056	New York.
30	Lyon, William H.	Maple St., Lexington, Mass.	14316	Boston.
8	*Lytle, John R.	525 Bush St., San Francisco, Cal.	13875	San Francisco.
24	*MacDuff, Sydney G.	7 Kelvingrove Ter., Glasgow, Scotland.	15276	Brooklyn. ¹
20	*MacPherson, William D.	549 A St., Lorain, Ohio.	13764	Chicago.
19	Malloy, Bernard J.	187 Sands St., Brooklyn, N. Y.	15274	Brooklyn. ¹
15	*Martin, Patrick	2707 Briggs Ave., New York, N. Y.	15027	New York.
11	Martinez y Gomez, Porfirio	207 Streef No. 3, Habana, Cuba.	13406	San Juan, P. R. ¹
6	McGrath, Joseph L.	206 Fayette St., Wollaston, Mass.	14284	Boston.
4	McHugh, John A.	23 Woodland Pl., White Plains, N. Y.	15283	Brooklyn. ¹
18	McKinnon, Daniel T.	Spiltoon, Wash.	14773	Seattle.
23	*Meldrum, Herbert J.	115 Winthrop St., Boston, Mass.	14307	Boston.
5	*Michael, Louis J.	82 Vanderveer St., Brooklyn, N. Y.	15285	Brooklyn. ¹
3	Miller, Frank L.	4625 N. Hermitage Ave., Chicago, Ill.	13748	Chicago.
24	Miller, Julius L.	179 Marcy Ave., Brooklyn, N. Y.	15282	Brooklyn. ¹
14	*Mowat, Alexander	2105 Bienville St., New Orleans, La.	14197	New Orleans.
9	*Norman, Stacy W.	4511 8th Ave., N. E., Seattle, Wash.	14765	Seattle.
20	*Oliver, Charles L.	Hubert Bldg., San Francisco, Cal.	13876	San Francisco.
27	*Onens, John F.	Mantua, N. J.	12217	Baltimore.
3	*O'Sullivan, James A.	Sayville, N. Y.	15031	New York.
24	Parker, Perry	Fort Angeles, Wash.	14766	Seattle.
18	*Perry, Clarence A.	866 32d St., Oakland, Cal.	13887	San Francisco.
5	*Perry, Edgar D.	Underwood, Wash.	14767	Seattle.
12	*Phair, Richard J.	2265 Mission St., San Francisco, Cal.	13874	San Francisco.
15	*Phillips, Everett E.	Box 693, S. San Francisco, Cal.	13879	Do.
10	*Pohl, Julius A.	303 Hennen Annex, New Orleans, La.	14194	New Orleans.
16	Preiss, Charles E.	473 Central Ave., Brooklyn, N. Y.	15271	Brooklyn. ¹
23	Prine, Forest	1318 7th Ave., Seattle, Wash.	14775	Seattle.
5	*Redfern, Otto R.	209 Garside St., Newark, N. J.	15018	New York.
5	*Rennard, Edgar B.	Radio Station, Tela, Honduras.	14192	New Orleans.
30	*Reynolds, Harry M.	Care Alaska Steamship Co., Seattle, Wash.	14788	Seattle.
27	*Ritschie, Hans Carl J.	153 1st St., Hoboken, N. J.	15030	New York.
12	*Rodman, Harold L.	402 W. Queen St., Inglewood, Cal.	13880	San Francisco.
5	Rosenthal, Charles S.	909 Jefferson Ave., Brooklyn, N. Y.	15284	Brooklyn. ¹
12	Russell, Adam	1 Byron St., Worcester, Mass.	14301	Boston.
25	Russell, Conrad A.	Valparaiso, Ind.	13753	Chicago.
29	Ruescher, Charles M.	Box 256, Sayville, N. Y.	15277	Brooklyn. ¹
11	Semons, Roger W.	2 Waverly Ave., Cliftondale, Mass.	14296	Boston.
12	Shannon, Frank	5308 Haverford Ave., Philadelphia, Pa.	12921	Philadelphia. ¹
11	*Snow, Herbert E.	Stapleton, N. Y.	15023	New York.
31	Stagg, Uberto K.	Noroton Heights, Conn.	14310	Boston.
5	*Stewart, John A.	La Ceiba, Spanish Honduras	14193	New Orleans.
23	Sturdevant, Leland W.	Care Alaska Packers Assn., San Francisco, Cal.	13886	San Francisco.
5	Sullivan, John F.	485 E. 6th St., Boston, Mass.	14293	Boston.
11	*Swenland, Wayland D.	303 Hollow Ave., Seattle, Wash.	14780	Seattle.
24	Swenson, Joseph	8040 Meridian Ave., Seattle, Wash.	14776	Do.
16	*Swett, Walter J.	53 Chelsea St., Charlestown, Mass.	14305	Boston.

* License issued as renewal of expiring license without examination. Otherwise license issued on written examination.

¹ License issued by radio examining officer, Navy Department.

First grade—Continued.

Date.	Licensee.	Address.	Serial No.	Where issued.
16	* Talbot, Norman D.....	25 Elm St., New York, N. Y.....	12215	Baltimore.
10	* Temple, Otto C.....	82 Himrod St., Brooklyn, N. Y.....	15270	Brooklyn. ¹
11	Theolan, Costas S.....	200 Columbus Ave., Boston, Mass....	14295	Boston.
2	* Thompson, Maurice.....	Madison Apts., 11th St., San Pedro, Cal.	13871	San Francisco.
31	* Thompson, Thomas B.....	Care Alaska Steamship Co., Seattle, Wash.	14779	Seattle.
16	* Ticknor, Reginald.....	San Francisco, Cal.....	13882	San Francisco.
12	Todd, Stedman F.....	415 Hillside Court, Piedmont, Cal.....	13881	Do.
12	Walton, Kenneth B.....	101 Dudley Ave., Narberth, Pa.....	12920	Philadelphia. ¹
26	* Ward, Frank A.....	321 St. Charles St., New Orleans, La.	14198	New Orleans.
12	* Warnock, Archie D.....	118 W. Myrtle St., Hanford, Cal.....	15026	New York.
2	* West, Howard B.....	479 Church St., Long Branch, N. J.....	15013	Do.
28	* Wheeler, R. L.....	Little Falls, N. Y.....	15153	Norfolk.
22	* Wilkinson, Frank O.....	309 19th St., Milwaukee, Wis.....	13750	Chicago.
6	Williams, Harold A.....	Belmont Ave., Floral Park, N. Y.....	15268	Brooklyn. ¹
13	* Williamson, Grover.....	Marshfield, Oreg.....	14770	Seattle.
11	* Wolfe, Albert E.....	East San Pedro, Cal.....	13878	San Francisco.

Second grade.

10	Bechloff, Claude B.....	106 Walnut St., Ridgewood, N. J.....	13845	Brooklyn. ¹
18	Benson, Lester A.....	4156 Shaw Ave., St. Louis, Mo.....	12397	St. Louis.
18	Blatterman, Headlee.....	6172 Westminster Pl., St. Louis, Mo.....	12398	Do.
5	Bylander, Sven A.....	1414 Abratraz Ave., Berkeley, Cal.....	13226	San Francisco.
24	Carruthers, David.....	135 Waverly Pl., New York, N. Y.....	13352	Brooklyn. ¹
22	Cholcener, Theodore R.....	615 Hancock St., Brooklyn, N. Y.....	13849	Do. ¹
12	Dahl, Chester W.....	160 Grenville St., New Bedford, Mass.	12074	Boston.
30	Driscoll, Patrick J.....	19 Liberty Ave., Dongan Hills, N. Y.....	13354	Brooklyn. ¹
9	Elwell, Todd.....	401 E. 36th St., Paterson, N. J.....	13844	Do. ¹
22	Falco, Charles C.....	140 Sanis St., Brooklyn, N. Y.....	13848	Do. ¹
19	Finchout, Fred.....	1310 E. New York St., Indianapolis, Ind.	12399	Indianapolis.
4	Grummet, Melvin L.....	9525 Fourth Ave., Brooklyn, N. Y.....	13839	Brooklyn. ¹
16	Henkin, Ascher.....	355 Stockton St., Brooklyn, N. Y.....	13847	Do. ¹
22	Hoff, Russell.....	298 Western Ave., Albany, N. Y.....	13850	Do. ¹
18	Johnson, Geo. F.....	625 Black Ave., Springfield, Ill.....	12396	St. Louis.
9	Knights, Alexander H.....	862 Hewitt Pl., New York, N. Y.....	13842	Brooklyn. ¹
28	Lambert, Kenneth B.....	11 Glenview Ave., Iowa City, Iowa.....	12394	Davenport, Iowa.
16	MaDan, Edwin.....	7402 17th Ave., Brooklyn, N. Y.....	13353	Brooklyn. ¹
29	McIlvaine, Victor C.....	208 Verne St., Tampa, Fla.....	12154	Baltimore.
5	Moy, Donald W.....	174 Second St., Milwaukee, Wis.....	13749	Chicago.
16	O'Brien, Lester E.....	Wilkinson, Wash.....	12277	Seattle.
5	O'Herin, John M.....	25 W. 125th St., New York, N. Y.....	13841	Brooklyn. ¹
21	Ostrowich, Thaddeus J.....	116 Waverly Pl., New York, N. Y.....	13351	Do. ¹
7	Powell, Edwin L.....	216 Spruce Ave., Takoma Park, Md.....	12007	Washington.
4	Salim, Saim.....	53 E. 117th St., New York, N. Y.....	13840	Brooklyn. ¹
9	Shipley, Reid S.....	153 E. 86th St., New York, N. Y.....	13847	Do. ¹
9	Skeete, Benjamin B.....	39 Lexington Ave., Brooklyn, N. Y.....	13843	Do. ¹
19	Sommer, James McC.....	2538 N. Talbott Ave., Indianapolis, Ind.	12400	Indianapolis.
30	Toft, Frank.....	Mountain View, Cal.....	13227	San Francisco.
4	Valentine, Milton L.....	Bayside, N. Y.....	13838	Brooklyn. ¹
16	Wittiek, Eugene C.....	104 6th Ave., Moline, Ill.....	12395	Davenport, Iowa.

* License issued as renewal of expiring license without examination. Otherwise license issued on written examination.

¹ License issued by radio examining officer, Navy Department.

* License issued in December; particulars received at Bureau too late for publication in December list.

NOTICE TO RADIO OPERATORS.

Until further notice, the examining of radio operators for all grades of licenses at the Boston, Brooklyn, Philadelphia, Charleston, New Orleans, Mare Island, and Bremerton Navy Yards, the Key West naval radio station, and Fort Wood, N. Y., will be discontinued.

Examinations formerly given by the radio examining officers at these points will be conducted by the radio inspectors of the Department of Commerce, exclusively. All applicants for radio operator licenses should apply to the nearest radio inspector, whose addresses are given below:

Boston, Mass.....	Seventh floor, United States Customhouse.
New York, N. Y.....	Room 603, United States Customhouse.
Baltimore, Md.....	Room 15, United States Customhouse.
Washington, D. C.....	Room 1010, Department of Commerce.
Norfolk, Va.....	Room 222, Citizens' Bank Building.
New Orleans, La.....	Room 235, United States Customhouse.
San Francisco, Cal.....	Room 526, United States Customhouse.
Seattle, Wash.....	Room 204, Federal Building.
Chicago, Ill.....	Room 629, Federal Building.

RADIO APPARATUS FOR DUTCH STEAMSHIP COMPANIES.

Holland's larger steamship companies have recently established a corporation called the Netherlands Telegraphic Co., "Radio-Holland," for the purpose of undertaking the manufacture of radio apparatus for use on Dutch vessels. It is hoped thus to free Dutch shipping from the dependence on foreign companies.

The new "Radio-Holland" is capitalized at \$400,000. The directors comprise representatives of the Holland-America Line, Holland Lloyd, Royal Packet, West Indian Mail, Royal Holland Steamboat, and Java-China-Japan Line.

CLASSIFICATION OF SPECIAL STATIONS.

There seems to be some misunderstanding concerning the classification of special stations, as provided in the Laws and Regulations, edition of July 27, 1914, pages 55 and 56.

Experiment stations.—In the case of experiment stations, such licenses are issued for the purpose of conducting experiments for the development of the science of radio communication, or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wave lengths, at such hours and under such conditions as will insure the least interference, and where the owners of such stations desire to conduct the usual amateur communications, or engage in the amateur relay league work, this work should be performed on certain authorized wave lengths covered by a license issued for the purpose. It has been found that practically all experiments for the development of radio apparatus can be conducted on an artificial antenna. It may be necessary on special occasions to make tests with some other station for the purpose of determining some special characteristic of the station, this, of course, being permitted.

Technical and training school stations.—In the case of technical and training school stations, these licenses are issued principally for the purpose of training radio operators, and it is believed that most of this work can be conducted without exceptional power and on wave lengths not exceeding 200 meters. Some of the schools turning out the largest number of operators have not found it necessary to do outside transmitting. This part of the training is conducted on buzzers arranged on an interior circuit. Should such stations desire to take part in the amateur relay league work, they should apply for special amateur licenses. Relay work should be conducted on a special wave length designated by the bureau, and ordinary outside communications should be conducted on a wave length not exceeding 200 meters.

Special amateur stations.—In the case of special amateur stations, a wave length in excess of 200 meters is permitted for the special amateur relay work, or emergency work such as that performed in the flood districts, and ordinary communications between special amateur and general amateur stations should not in any case be conducted on wave lengths in excess of 200 meters.

It should be borne in mind by applicants for experiment, technical, and training school, and special amateur station licenses, that the special wave lengths in excess of 200 meters, or power in excess of one-half kilowatt or one kilowatt, depending upon the location of the station, can not be granted for ordinary amateur work, and where stations given special licenses make use of this special power and these special wave lengths for ordinary amateur communication, and such stations are reported to the Bureau for causing interference, their station licenses may be suspended or revoked.

It should also be understood by the holders of special station licenses along the coast that the wave lengths of 300 meters and 600 meters authorized for these stations are solely for the purpose of "listening in" as required by the regulations, and are to be used for transmitting only in the event of an emergency such as is contemplated in the regulations.

Where it is desired and appears necessary that two classes of license be issued to a station, two applications should be sent in, one to cover each class of service, as, for example, experiment and special amateur, or experiment and general amateur.

Recently, there have been several applications received at the Bureau for experiment licenses where it appeared that the stations were to be used for limited commercial service.

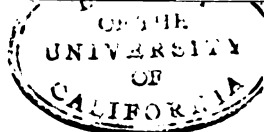
All applicants for special licenses should furnish the Bureau, through the radio inspector, a statement covering completely the service which is to be conducted by the stations, and indicating the necessity for special power and wave lengths.

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OCT 25 1919



RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE.

Washington, August 1, 1919—No. 28.

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations; published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Operated and controlled by—	Address.
Port Beauclaire.....	KWO	Beauclaire Packing Co.....	Seattle, Wash.
Port Chatham.....	KWH	Alaska Ocean Food Co.....	Grand Trunk Pacific Dock, Seattle, Wash.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		<i>Cents.</i>	<i>Cents.</i>				
Arenas.....	KIRM	4	4	PG	X	U. S. Shipping Board.	U. S. Navy.
Assinippi.....	KIPB	4	4	PG	X	do.	Do.
Bathalum.....	KIQT	4	4	PG	X	do.	Do.
Bathgate.....	KIQS	4	4	PG	X	do.	Do.
Bay Head.....	KINT	4	4	PG	X	do.	Do.
Belfort.....	KIQB	4	4	PG	X	do.	Do.
Boston Bridge.....	KINS	4	4	PG	X	do.	Do.
Burnwell.....	KIMS	4	4	PG	X	do.	Do.
Calno.....	KINV	4	4	PG	X	do.	Do.
Cambridge.....	KIRR	4	4	PG	X	do.	Do.
Canumset.....	KIQD	4	4	PG	X	do.	Do.
Cleopatra.....	KIQL	4	4	PG	X	do.	Do.
Cold Spring.....	KIQK	4	4	PG	X	do.	Do.
Corson.....	KIQV	4	4	PG	X	do.	Do.
Costigan.....	KINF	4	4	PG	X	do.	Do.
Cotati.....	KIQF	4	4	PG	X	do.	Do.
Cushnoc.....	KIMJ	4	4	PG	X	do.	Do.
Davidson County.....	KINX	4	4	PG	X	do.	Do.
Delavan.....	KIRQ	4	4	PG	X	do.	Do.
Derbyline.....	KIRT	4	4	PG	X	do.	Do.
Dochet.....	KIMR	4	4	PG	X	do.	Do.
Doylestown.....	KIPG	4	4	PG	X	do.	Do.
East Side.....	KIMQ	4	4	PG	X	do.	Do.
Edna.....	KIPT	4	4	PG	X	do.	Do.
Eelbeck.....	KINQ	4	4	PG	X	do.	Do.
Fluor Spar.....	KIQX	4	4	PG	X	do.	Do.
Ft. Logan.....	KIQJ	4	4	PG	X	do.	Do.
Geo. H. Jones.....	KIPS	4	4	PG	X	do.	Do.
Haddon.....	KIRN	4	4	PG	X	do.	Do.
Huachuca.....	KIMX	4	4	PG	X	do.	Do.
Hugoton.....	KIQR	4	4	PG	X	do.	Do.
Hyannis.....	KINC	4	4	PG	X	do.	Do.
John F. na.....	KIRS	4	4	PG	X	do.	Do.
Lake Cannonsburg.....	KIMV	4	4	PG	X	do.	Do.
Lake Fabius.....	KIPQ	4	4	PG	X	do.	Do.
Lake Fabyan.....	KINJ	4	4	PG	X	do.	Do.
Lake Fackler.....	KIQP	4	4	PG	X	do.	Do.
Lake Fairfax.....	KIRV	4	4	PG	X	do.	Do.
Lake Farber.....	KIRB	4	4	PG	X	do.	Do.
Lake Farmingdale.....	KIPZ	4	4	PG	X	do.	Do.
Lake Farragut.....	KIQN	4	4	PG	X	do.	Do.
Lake Festina.....	KEQP	4	4	PG	X	do.	Do.
Lake Frolono.....	KEGN	4	4	PG	X	do.	Do.
Lake Frumet.....	KIRJ	4	4	PG	X	do.	Do.
Lake Gazette.....	KIPN	4	4	PG	X	do.	Do.
Lake Glasco.....	KINK	4	4	PG	X	do.	Do.
Lehigh.....	KINM	4	4	PG	X	do.	Do.
Liberty Glo.....	KIQZ	4	4	PG	X	do.	Do.
Luxpallie.....	KIPV	4	4	PG	X	do.	Do.
Maiden Creek.....	KIPX	4	4	PG	X	do.	Do.
Mount Evans.....	KIMT	4	4	PG	X	do.	Do.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—
continued.

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by--
		North and South American service.	Trans-oceanic service.				
		<i>Cents.</i>	<i>Cents.</i>				
Nedmac.....	KIQM	4	4	PG	X	U. S. Shipping Board.	U. S. Navy.
New Britain.....	KIRG	4	4	PG	X	do.....	Do.
Newton.....	KIRC	4	4	PG	X	do.....	Do.
Ogontz.....	KINB	4	4	PG	X	do.....	Do.
Olen.....	KINR	4	4	PG	X	do.....	Do.
Pawtucket.....	KINZ	4	4	PG	X	do.....	Do.
Pelican.....	KIRL	4	4	PG	X	do.....	Do.
Pere Marquette 8.....	KINL					Chicago & South Haven S. S. Co.	Do.
Pipestone County.....	KIMZ	4	4	PG	X	U. S. Shipping Board.	Do.
Pontchartrain.....	KIMP	4	4	PG	X	do.....	Do.
Pontia.....	KIPC	4	4	PG	X	do.....	Do.
Pyramus.....	KIPL	4	4	PG	X	do.....	Do.
Rock Island.....	KIND	4	4	PG	X	do.....	Do.
Salvation Lass.....	KIMN	4	4	PG	X	do.....	Do.
Santa Leonora.....	KIML	4	4	PG	X	do.....	Do.
S. B. Hunt.....	KIPR	4	4	PG	X	do.....	Do.
Sharon.....	KIRK	4	4	PG	X	do.....	Do.
Strathnaver.....	KIPP	4	4	PG	X	do.....	Do.
Thala.....	KIQQ	4	4	PG	X	do.....	Do.
Utina.....	KIPM	4	4	PG	X	do.....	Do.
Vacuum II.....	KIMK	4	4	PG	X	do.....	Do.
Waco.....	KIRP	4	4	PG	X	do.....	Do.
Wallkill.....	KIPD	4	4	PG	X	do.....	Do.
Watertown.....	KING	4	4	PG	X	do.....	Do.
West Aleta.....	KIQG	4	4	PG	X	do.....	Do.
West Cayote.....	KIRF	4	4	PG	X	do.....	Do.
West Chatala.....	KIPJ	4	4	PG	X	do.....	Do.
West Hepburn.....	KINP	4	4	PG	X	do.....	Do.
West Ison.....	KINN	4	4	PG	X	do.....	Do.
Westmoreland.....	KIQC	4	4	PG	X	do.....	Do.
West Segovia.....	KIPK	4	4	PG	X	do.....	Do.
Winyah.....	KIMM	4	4	PG	X	do.....	Do.
Woodmansie.....	KIPF	4	4	PG	X	do.....	Do.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KEON	Lake Frolono.....b	KIPP	Strathnaver.....b
KEQP	Lake Festina.....b	KIPO	Lake Fabius.....b
KIMJ	Cushnoc.....b	KIPR	S. B. Hunt.....b
KIMK	Vacumm II.....b	KIPS	Geo. H. Jones.....b
KIML	Santa Lenora.....b	KIPT	Edna.....b
KIMM	Winyah.....b	KIPX	Malden Creek.....b
KIMN	Salvation Lass.....b	KIPV	Luxpallie.....b
KIMP	Pontchartrain.....b	KIPZ	Lake Farmingdale.....b
KIMQ	East Side.....b	KIQB	Belfort.....b
KIMR	Dochet.....b	KIQC	Westmoreland.....b
KIMS	Burnwell.....b	KIQD	Canumset.....b
KIMT	Mount Evans.....b	KIQF	Cotati.....b
KIMV	Lake Cannonsburg.....b	KIQG	West Aleta.....b
KIMX	Huachuca.....b	KIQJ	Ft. Logan.....b
KIMZ	Pipestone County.....b	KIQK	Cold Spring.....b
KINB	Ogontz.....b	KIQL	Cleopatra.....b
KINC	Hyannis.....b	KIQM	Nedmac.....b
KIND	Rock Island.....b	KIQN	Lake Farragut.....b
KINF	Costigan.....b	KIQP	Lake Packler.....b
KING	Watertown.....b	KIQQ	Thala.....b
KINJ	Lake Fabyan.....b	KIQR	Hugoton.....b
KINK	Lake Glasco.....b	KIQS	Bathgate.....b
KINL	Pere Marquette 8.....b	KIQT	Bathalum.....b
KINM	Lehigh.....b	KIQV	Corson.....b
KINN	West Ison.....b	KIQX	Fluor Spar.....b
KINP	West Hepburn.....b	KIQZ	Liberty Glo.....b
KINQ	Eelbeck.....b	KIRB	Lake Farber.....b
KINR	Olen.....b	KIRC	Newton.....b
KINS	Boston Bridge.....b	KIRF	West Cayote.....b
KINT	Bay Head.....b	KIRG	New Britain.....b
KINV	Calno.....b	KIRJ	Lake Frumet.....b
KINX	Davidson County.....b	KIRK	Sharon.....b
KINZ	Pawtucket.....b	KIRL	Pelican.....b
KIPB	Assinippi.....b	KIRM	Arenas.....b
KIPC	Pontia.....b	KIRN	Haddon.....b
KIPD	Walkill.....b	KIRP	Waco.....b
KIPF	Woodmansie.....b	KIRO	Delavan.....b
KIPG	Doylstown.....b	KIRR	Cambridge.....b
KIPJ	West Chatala.....b	KIRS	John Ena.....b
KIPK	West Segovia.....b	KIRT	Derbyline.....b
KIPL	Pyramus.....b	KIRV	Lake Fairfax.....b
KIPM	Utina.....b	KWH	Port Chatham, Alaska.....c
KIPN	Lake Gazette.....b	KWO	Port Beauclair, Alaska.....c

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Operated and controlled by—	Address.
Bellefonte, Pa. ¹	WWQ	Post Office Department.....	Washington, D. C.
Chicago, Ill. ¹	WWG	do.....	Do.
Cleveland, Ohio ¹	WVO	do.....	Do.
College Park, Md. ¹	WWX	do.....	Do.
Newark, N. J. ¹	WWU	do.....	Do.
Seward, Alaska.....	NPV	U. S. Navy.....	Do.

¹ Aeroplane control station.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Abel P. Upshur.....	NUJD	Old Dominion.....	NUKN
Alameda.....	NUGJ	Overton.....	NUJN
Atlantic.....	NENN	Patoka.....	NUGN
Barker.....	NUJK	Ramapo.....	NUGP
Chesapeake.....	NUJB	Rapidan.....	NUGQ
Doyen.....	NUJS	Relief Light Vessel No. 2.....	NUGF
George E. Badger.....	NUJG	Robert Smith.....	NUKB
Henshaw.....	NUJQ	Salinas.....	NUGR
Hulbert.....	NUKD	Sapaleo.....	NUGS
Hunt.....	NUJF	Sepulga.....	NUGT
James K. Paulding.....	NUJM	Shirk.....	NUJV
Kaweah.....	NUGK	Smith Thompson.....	NUJJ
Kidder.....	NUJX	Sturtevant.....	NUJP
Laramie.....	NUGL	Tippicanoe.....	NUGV
La Valette.....	NUJT	Tracy.....	NUJL
Mattole.....	NUMG	Trinity.....	NUGX
Meyer.....	NUJR	Wasmuth.....	NUKC
Nahunta.....	NUKM	W. F. Babcock.....	NUKG
Noa.....	NUKF		

GOVERNMENT LAND AND SHIP RADIO STATIONS, ALPHABETICALLY BY CALLS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919. c—land station; b—ship station.]

Call signal.	Name of station.	Call signal.	Name of station.
NPV	Seward, Alaska.....c	NUJN	Overton.....b
NUGF	Relief Light Vessel No. 2.....b	NUJP	Sturtevant.....b
NUGJ	Alameda.....b	NUJQ	Henshaw.....b
NUGK	Kaweah.....b	NUJR	Meyer.....b
NUGL	Laramie.....b	NUJS	Doyen.....b
NUMG	Mattole.....b	NUJT	La Valette.....b
NUGN	Patoka.....b	NUJV	Shirk.....b
NUGP	Ramapo.....b	NUJX	Kidder.....b
NUGQ	Rapidan.....b	NUKB	Robert Smith.....b
NUGR	Salinas.....b	NUKC	Wasmuth.....b
NUGS	Sapaleo.....b	NUKD	Hulbert.....b
NUGT	Sepulga.....b	NUKF	Noa.....b
NUGV	Tippicanoe.....b	NUKG	W. F. Babcock.....b
NUGX	Trinity.....b	NUKM	Nahunta.....b
NUJB	Chesapeake.....o	NUKN	Old Dominion.....b
NUJD	Abel P. Upshur.....b	NENN	Atlantic.....b
NUJF	Hunt.....b	WWG	Chicago, Ill. ¹.....c
NUJG	George E. Badger.....b	WWO	Cleveland, Ohio ¹.....c
NUJJ	Smith Thompson.....b	WWU	Newark, N. J. ¹.....c
NUJK	Barker.....b	WWQ	Bellefonte, Pa. ¹.....c
NUJL	Tracy.....b	WWX	College Park, Md. ¹.....c
NUJM	James K. Paulding.....b		

¹ Aeroplane control station of Post Office Department.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, only.]

Station.	Call signal.	Station controlled by—
College Station, Tex.....	5YA	Agricultural and Mechanical College of Texas.
Atlanta, Ga.....	4YA	Georgia School of Technology.
Agricultural College, N. Dak.....	9YB	North Dakota Agricultural College.
Lafayette, Ind.....	9YA	Purdue University.
Kingston, R. I.....	1YA	Rhode Island State College.
Tuscaloosa, Ala.....	5YB	University of Alabama.
Los Angeles, Calif.....	6YA	University of Southern California.
Morgantown, W. Va.....	8YA	West Virginia University.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1YA	First district: Kingston, R. I.	6YA	Sixth district: Los Angeles, Calif.
4YA	Fourth district: Atlanta, Ga.	8YA	Eighth district: Morgantown, W. Va.
5YA	Fifth district:	9YA	Ninth district:
5YB	College Station, Tex.	9YB	Lafayette, Ind.
	Tuscaloosa, Tex.		Agricultural College, N. Dak.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name = Name of station.

G. loc. = Geographical location: O=west longitude, N=north latitude, S=south latitude.

Call = Call letters assigned.

System = Radio system used and sparks per second.

Range = Normal range in nautical miles.

W. L. = Wave lengths assigned: Normal wave lengths in italics.

Service = Nature of service maintained:

PG = General public.

PR = Limited public.

P = Private.

O = Government business exclusively.

Hours = Hours of operation:

N = Continuous service.

X = No regular hours.

m = a. m. (12m=midday).

s = p. m. (12s=midnight).

Rates = Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes = Refer to notes in the Berne list.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne Bureau.]

Accomac (KMOE).
 Anne W. (WMU).
 City of South Haven (WDI).
 Diana (KZM).
 Farnam (KQIE).
 Goliath (WPG).
 Great Northern (WIR).
 Isthmian (WKI).
 Luckenbach No. 1 (KEO).
 Luckenbach No. 2 (KGC).
 Luckenbach No. 3 (KGF).
 Luckenbach No. 4 (KGG).
 Luckenbach No. 5 (KEV).
 Lydonia (WDY).
 Mackinaw (WHW).
 May (KZI).

Nevada (WFD).
 Niagara (KYN).
 Nokomis (WHD).
 Northern Pacific (WIM).
 Orleanian (KON).
 Roamer (KZN).
 Santa Cristina (WHO).
 Sayonara (KYJ).
 Sialia (WFY).
 Theodore Roosevelt (WCT).
 Tyee (WPC).
 Virginia (WFH).
 Virginia (KFR).
 Wakiva (KYI).
 Warrior (KYW).

Strike out all particulars of the above-named vessels.

Huron (WCH), owner Huron S. S. Co. (Inc.).	Socony No. 84, correct name Socony 84.
Margaret (WRQ), owner Margaret Ship Co. (Inc.).	Socony No. 85, correct name Socony 85.
Panuco (KWM), owner Atlantic Gulf & West Indies S. S. Lines.	Socony No. 88, correct name Socony 88.
Parthian (WCE), owner U. S. Shipping Board.	Socony No. 89, correct name Socony 89.
Rosewood (WSH), owner Pacific-American Fisheries.	Socony No. 90, correct name Socony 90.
Socony No. 82, correct name Socony 82.	Socony No. 92, correct name Socony 92.
Socony No. 83, correct name Socony 83.	Socony No. 94, correct name Socony 94.
	S. M. Spaulding, correct orthography S. M. Spalding.
	Suruga, owner New York & Oriental S. S. Co.
	Susanna, correct orthography Susana.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals, KEO, KEV, KFR, KGC, KGF, KGG, KMOE, KON, KQIE, KYI, KYJ, KYN, KYW, KZI, KZM, KZN, WCT, WDY, WFD, WFH, WFY, WHD, WHO, WHW, WIM, WIR, WKI, WPC, WPG, WDI, and WMU. KRUI, *read* Socony 88; KSAA, *read* Socony 89; KVAO, *read* Socony 83; KVAI, *read* Socony 82; WCOE, *read* Socony 84; WCOI, *read* Socony 92; WKAE, *read* Socony 85; WTII, *read* Socony 90; WTIO, *read* Socony 94; KNX, *read* Susana; and WKG, *read* S. M. Spalding.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

Light Vessel No. 86, Great Round Shoals, Mass., *read* Relief Light Vessel No. 86, (NAJJ).

Relief Light Vessel No. 66, *read* Light Vessel No. 66, Great Round Shoals, Mass. (NABJ).

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

Accomac (NTH).	Luella (NALJ).
Askawake (NEPP).	Nashville (NKY).
Bache (NLK).	Natoma (NUGG).
Christabel (NMQ).	Oneida (NSO).
Cizenia (NBP).	Paducah (NOG).
Corozal (NEGX).	Pathfinder (NLJ).
Crook (NECX).	Pequot (NEVN).
Cuttyhunk (NSA).	Piqua (NMU).
Decatur (NJC).	Polarland (NEMM).
Druid (NDP).	Polar Sea (NANL).
Eastern Cross (NEZB).	Princeton (NEGT).
Eddelyn (NEDV).	Remus (NENR).
Ellington (NLN).	Robert McCurdy (NAXB).
Federal (NEGP).	Rondo (NBK).
Fort Snelling (NEVF).	Roosevelt (NLR).
Forward (NUFS).	Santee (NAPD).
Helenita (NAKK).	Sao Paulo (NEGJ).
Herbert L. Pratt (NANM).	Seatia (NCQ).
Hermes (NRP).	Sherman (NECJ).
Indianapolis (NISD).	Sixaola (NENC).
Isis (NQA).	Soestdijk (NAPJ).
Kiowa (NAKR).	Sultana (NMX).
Lake Champlain (NHR).	S. P. 651 (Atlantic II) (NOR).
Lake Dwyer (NEMF).	Warren (NEBN).
Lake Lillian (NESF).	Wawalon (NEQN).
Lake Sunapee (NECS).	Westwood (NAQL).
Liscum (NECL).	Winterswijk (NEGV).
Los Angeles (NSG).	

Strike out all particulars of the above-named vessels.

Kewaydin (NAXN), correct orthography
Kemaydin.
S. P. 411 (Sussanne), correct orthography
S. P. 411 (Susanne).
S. P. 568 (Magnet) (NUBG), correct
number 563.

Tatnuck (NETQ), correct orthography
Tatmuck.
Truxton, correct orthography Truxtun.
Wilmette, correct orthography Willmette.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals, NBK, NCQ, NDP, NJC, NHR, NKY, NLJ, NLK, NLN, NLR, NMQ, NMU, NOG, NOR, NQA, NRP, NSA, NSG, NSO, NTH, NAKK, NAKR, NALJ, NANL, NANM, NAPD, NAPJ, NAQL, NAXB, NEBN, NECJ, NECL, NECS, NECX, NEDV, NEGJ, NEGP, NEGT, NEGJ, NEGX, NEMF, NEMM, NENC, NENR, NEPP, NEQN, NESF, NEVF, NEVN, NEZB, NISD, NUBP, NUFS, and NUGG. NUS, *read* Truxtun; NABJ, *read* L. V. No. 66, Great Round Shoals, Mass.; NAJJ, *read* Relief L. V. No. 86; NAVD, *read* Willmette; NAXN, *read* Kemaydin; NETQ, *read* Tutmuck; NUBG, *read* S. P. 563 (Magnet); and NUBN, *read* S. P. 411 (Susanne).

MISCELLANEOUS.

AMENDMENTS.

The Radio Laws and Regulations of the United States, edition July 27, 1914, are hereby amended as follows:

Paragraph 122, page 63, amended December 20, 1918, to read:

Amateur, first grade.—The applicant must have a sufficient knowledge of the adjustment and operation of the apparatus which he wishes to operate and of the regulations of the international convention and acts of Congress in so far as they relate to the interference with other radio communication and impose certain duties on all grades of operators. The applicant must be able to transmit and receive Continental Morse code at a speed sufficient to enable him to recognize distress calls or the official "keep-out" signals. A speed of at least 10 words per minute (5 letters to the word) must be obtained.

Paragraph 126, page 64, amended December 20, 1918, to read:

The code test shall continue for five minutes at a speed of 20 words, 12 words, and 10 words per minute, respectively, for the commercial first, second, and amateur first-grade license, 5 letters, numerals, or other characters to the word, and to qualify the applicant must receive 20, 12, and 10 words in consecutive order accurately and legibly written. Operators will not be permitted to break or interrupt while receiving or to correct or alter the transcription after it has been submitted to the examining officer.

Radio operators' examinations are held by the radio inspectors at the following ports: At the customhouse in Boston, New York, Baltimore, New Orleans, and San Francisco; Federal Building in Chicago and Detroit; 205 Citizens Bank Building, Norfolk; and 2301 L. C. Smith Building, Seattle.

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APR 28 1926

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE.

Washington, September 2, 1919—No. 29.

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Penake Inlet, Alaska.....	KYG	.....	.....	.....	Columbia Salmon Co.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Ablanset.....	KIXF	4	4	PG	X	U. S. Shipping Board..	Owner of vessel.
Abraham Lincoln.....	KIXS	4	4	PG	X	do.	Do.
Afel.....	KISQ	4	4	PG	X	do.	Do.
Asabeth.....	KIXG	4	4	PG	X	do.	Do.
Asquam.....	KISV	4	4	PG	X	do.	Do.
Babboosic.....	KITC	4	4	PG	X	do.	Do.
Bakersfield.....	KIZC	4	4	PG	X	do.	Do.
Baldbutte.....	KISM	4	4	PG	X	do.	Do.
Barthney.....	KIZD	4	4	PG	X	do.	Do.
Bellbuckle.....	KITK	4	4	PG	X	do.	Do.
Betsy Bell.....	KITM	4	4	PG	X	do.	Do.
Buffalo Bridge.....	KIZF	4	4	PG	X	do.	Do.
Casper.....	KIRX	4	4	PG	X	do.	Do.
Champion.....	KIXV	4	4	PG	X	do.	Do.
City of Fairbury.....	KISR	4	4	PG	X	do.	Do.
Custodian.....	KIVZ	4	4	PG	X	do.	Do.
Dauperata.....	KIZJ	4	4	PG	X	do.	Do.
Delco.....	KIZB	4	4	PG	X	do.	Do.
Delfina.....	KIVS	4	4	PG	X	do.	Do.
Delisle.....	KIVT	4	4	PG	X	do.	Do.
Devoiente.....	KIVR	4	4	PG	X	do.	Do.
Elkridge.....	KISG	4	4	PG	X	do.	Do.
Explorer.....	KIVN	4	4	PG	X	do.	Do.
Firtheliffe.....	KITF	4	4	PG	X	do.	Do.
Fourth Alabama.....	KIXJ	4	4	PG	X	do.	Do.
Glen Ridge.....	KIRZ	4	4	PG	X	do.	Do.
Guardsman.....	KIVX	4	4	PG	X	do.	Do.
Hatchie.....	KIVJ	4	4	PG	X	do.	Do.
Huguenot.....	KIVQ	4	4	PG	X	do.	Do.
Inoco.....	KITJ	4	4	PG	X	do.	Do.
Katherine.....	KIZK	4	4	PG	X	do.	Do.
Keshena.....	KITR	4	4	PG	X	do.	Do.
Kewanee.....	KIVC	4	4	PG	X	do.	Do.
Kiokee.....	KITS	4	4	PG	X	do.	Do.
Kitchi.....	KITV	4	4	PG	X	do.	Do.
Kittegaun.....	KITG	4	4	PG	X	do.	Do.
Kiron.....	KITT	4	4	PG	X	do.	Do.
Knights Island.....	KIVL	4	4	PG	X	do.	Do.
Laborer.....	KIST	4	4	PG	X	do.	Do.
Lackawanna Valley.....	KIXD	4	4	PG	X	do.	Do.
Lafcom.....	KIXK	4	4	PG	X	do.	Do.
Lake Flagon.....	KIXT	4	4	PG	X	do.	Do.
Lake Fagundus.....	KISN	4	4	PG	X	do.	Do.
Lake Fairlie.....	KISP	4	4	PG	X	do.	Do.
Lake Palama.....	KITB	4	4	PG	X	do.	Do.
Lake Farrar.....	KISX	4	4	PG	X	do.	Do.
Lake Fear.....	KIVM	4	4	PG	X	do.	Do.
Lake Gadsden.....	KITP	4	4	PG	X	do.	Do.
Lake Singara.....	KITQ	4	4	PG	X	do.	Do.
Lake Stobi.....	KISZ	4	4	PG	X	do.	Do.
Lebanon.....	KIXL	4	4	PG	X	do.	Do.
Liberty Land.....	KISS	4	4	PG	X	do.	Do.
Lightburne.....	KIVF	4	4	PG	X	do.	Do.
Lockport.....	KIXM	4	4	PG	X	do.	Do.
Lordship Manor.....	KIXN	4	4	PG	X	do.	Do.
Marina.....	KIVD	4	4	PG	X	do.	Do.
Minnequa.....	KIVB	4	4	PG	X	do.	Do.
Mercer Victory.....	KIVG	4	4	PG	X	do.	Do.
Nameaug.....	KITN	4	4	PG	X	do.	Do.

Commercial ship stations, alphabetically by names of vessels—Continued.

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
Nonantum.....	KIXP	Cents. 4	Cents. 4	PG	X	U. S. Shipping Board.	Owner of vessel.
Orcus.....	KISC	4	4	PG	X	do.	Do.
Parksville.....	KIZG	4	4	PG	X	do.	Do.
Putnam.....	KIXQ	4	4	PG	X	do.	Do.
Richmond Boro.....	KITX	4	4	PG	X	do.	Do.
Seattle Spirit.....	KISD	4	4	PG	X	do.	Do.
Stanley.....	KISJ	4	4	PG	X	do.	Do.
Traveller.....	KIVK	4	4	PG	X	do.	Do.
Tulsa.....	KIXR	4	4	PG	X	do.	Do.
Wekika.....	KIXX	4	4	PG	X	do.	Do.
West Cactus.....	KIVV	4	4	PG	X	do.	Do.
West Cheswald.....	KIXB	4	4	PG	X	do.	Do.
West Inskip.....	KITZ	4	4	BG	X	do.	Do.
West Keene.....	KISK	4	4	PG	X	do.	Do.
Westoll.....	KIVP	4	4	PG	X	do.	Do.
West Raritans.....	KIXC	4	4	PG	X	do.	Do.
West Selene.....	KIXZ	4	4	PG	X	do.	Do.
Wheatland Montana.....	KISF	4	4	PG	X	do.	Do.
Wytheville.....	KITI	4	4	PG	X	do.	Do.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KIRX	Casper..... b	KIVJ	Hatchie..... b
KIRZ	Glen Ridge..... b	KIVK	Traveller..... b
KISC	Orcus..... b	KIVL	Knights Island..... b
KISD	Seattle Spirit..... b	KIVM	Lake Fear..... b
KISF	Wheatland Montana..... b	KIVN	Explorer..... b
KISG	Elkridge..... b	KIVP	Westoll..... b
KISJ	Stanley..... b	KIVQ	Huguenot..... b
KISK	West Keene..... b	KIVR	Devolente..... b
KISM	Baldbutte..... b	KIVS	Delfina..... b
KISN	Lake Fagundus..... b	KIVT	Delisle..... b
KISP	Lake Fairlie..... b	KIVV	West Cactus..... b
KISQ	Afel..... b	KIVX	Guardsman..... b
KISR	City of Fairbury..... b	KIVZ	Custodian..... b
KISS	Liberty Land..... b	KIXB	West Cheswald..... b
KIST	Laborer..... b	KIXC	West Raritans..... b
KISV	Asquam..... b	KIXD	Lackawanna Valley..... b
KISX	Lake Farrar..... b	KIXE	Ablandset..... b
KISZ	Lake Stobl..... b	KIXF	Asabeth..... b
KITB	Lake Falama..... b	KIXG	Fourth Alabama..... b
KITC	Babbocost..... b	KIXH	Iafomo..... b
KITF	Firthcliffe..... b	KIXI	Lebanon..... b
KITG	Kittagaun..... b	KIXM	Lockport..... b
KITJ	Inoco..... b	KIXN	Lordship Manor..... b
KITK	Bellbuckle..... b	KIXP	Nonantum..... b
KITL	Wytheville..... b	KIXQ	Putnam..... b
KITM	Betsy Bell..... b	KIXR	Tulsa..... b
KITN	Nameaug..... b	KIXS	Abraham Lincoln..... b
KITP	Lake Gadsden..... b	KIXT	Lake Flagon..... b
KITQ	Lake Singara..... b	KIXU	Champion..... b
KITR	Koshena..... b	KIXX	Wekika..... b
KITS	Kiokee..... b	KIXZ	West Selene..... b
KITT	Kiron..... b	KIZB	Delco..... b
KITV	Kitchi..... b	KIZC	Bakersfield..... b
KITX	Richmond Boro..... b	KIZD	Barthney..... b
KITZ	West Inskip..... b	KIZF	Buffalo Bridge..... b
KIVB	Minnequa..... b	KIZG	Parksville..... b
KIVC	Kewanee..... b	KIZJ	Dauperata..... b
KIVD	Marina..... b	KIZK	Katherine..... b
KIVF	Lightburne..... b	KYG	Penakee Inlet, Alaska..... c
KIVG	Mercer Victory..... b		

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Alden.....	NULK	McCawley.....	NULS
Borie.....	NULL	Moody.....	NULT
Breakwater.....	NUMS	Mullany.....	NUML
Breck.....	NULZ	Murvine.....	NUMJ
Chase.....	NUMK	Neches.....	NIFP
Childs.....	NULN	Pecos.....	NIFQ
Contocook.....	NELR	Phalarope.....	NUKT
Harbor Tug No. 59.....	NUKQ	Sands.....	NULQ
Harbor Tug No. 60.....	NUKR	Sharkey.....	NULV
Harbor Tug No. 62.....	NUKZ	Sinclair.....	NULR
Harbor Tug No. 63.....	NULD	Sloat.....	NUMD
Harbor Tug No. 64.....	NUMT	Toucey.....	NULX
Harbor Tug No. 66.....	NULB	Trevey.....	NUMP
Harbor Tug No. 67.....	NULG	Wachusett.....	NFO
Harbor Tug No. 68.....	NUMR	Wainwright.....	NULF
Harbor Tug No. 85.....	NULC	Welborn C. Wood.....	NULJ
Hospital Ship No. 1.....	NEPQ	William B. Preston.....	NUMQ
Humphreys.....	NUKX	Winchester.....	NUKS
Kane.....	NULM	Wood.....	NUMF
King.....	NULP	Yarborough.....	NUMC
Litchfield.....	NUMM	Zane.....	NUMN
Mansfield.....	NUMG	Zeilin.....	NUMB
Marcus.....			

GOVERNMENT LAND AND SHIP RADIO STATIONS, ALPHABETICALLY BY CALLS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919. c=land station; b=ship station.]

Call signal.	Name of station.	Call signal.	Name of station.
NFO	Wachusett..... b	NULR	Sinclair..... b
NELR	Contocook..... b	NULS	McCawley..... b
NIFP	Neches..... b	NULT	Moody..... b
NEPQ	Hospital Ship No. 1..... b	NULV	Sharkey..... b
NIFQ	Pecos..... b	NULX	Toucey..... b
NUKQ	Harbor Tug No. 59..... b	NULZ	Breck..... b
NUKR	Harbor Tug No. 60..... b	NUMB	Zeilin..... b
NUKS	Winchester..... b	NUMC	Yarborough..... b
NUKT	Phalarope..... b	NUMD	Sloat..... b
NUKX	Humphreys..... b	NUMF	Wood..... b
NUKZ	Harbor Tug No. 62..... b	NUMG	Marcus..... b
NULB	Harbor Tug No. 66..... b	NUMJ	Murvine..... b
NULC	Harbor Tug No. 85..... b	NUMK	Chase..... b
NULD	Harbor Tug No. 63..... b	NUML	Mullany..... b
NULF	Wainwright..... b	NUMM	Litchfield..... b
NULG	Harbor Tug No. 67..... b	NUMN	Zane..... b
NULJ	Welborn C. Wood..... b	NUMP	Trevey..... b
NULK	Alden..... b	NUMQ	William B. Preston..... b
NULL	Borie..... b	NUMR	Harbor Tug No. 68..... b
NULM	Kane..... b	NUMS	Breakwater..... b
NULN	Childs..... b	NUMT	Harbor Tug No. 64..... b
NULP	King..... b	NUMV	Mansfield..... b
NULQ	Sands..... b		

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.
G. loc. =Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call =Call letters assigned.
System=Radio system used and sparks per second.
Range =Normal range in nautical miles.
W. L. =Wave lengths assigned: Normal wave lengths in italics.
Service=Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P =Private.
 O =Government business exclusively.
Hours =Hours of operation:
 N =Continuous service.
 X =No regular hours.
 m =a. m. (12m=midday).
 s =p. m. (12s=midnight).
Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
Notes =Refer to notes in the Berne list.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition, June 15, 1919, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

Strike out all particulars following Juneau and Ketchikan, Alaska.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

AIRLIE.—Note, Nacirema S. S. Corp. owner of vessel; station operated and controlled by Marconi Co.

AMPETCO.—Note, Standard Oil Co. of New Jersey, owner of vessel; station operated and controlled by Marconi Co.

BALESHED.—Name changed to Clincho.

BENSONI.—Correct name Benoni.

BIRCHLEAF.—Note, Nacirema S. S. Corp. owner of vessel; station operated and controlled by Marconi Co.

CARIB (KMIA).—Note, Carib S. S. Co. (Inc.), owner of vessel; station operated and controlled by Marconi Co.

CHITCHUNG.—Correct name Chipchung.

DALANA.—Note, Nacirema S. S. Corp. owner of vessel; station operated and controlled by Marconi Co.

DOCHRA.—Note, LaPlata S. S. Co. (Inc.), owner of vessel; station operated and controlled by Marconi Co.

KANABEC.—Note, French-American Line (Inc.), owner of vessel; station operated and controlled by Marconi Co.

LAKE FESTINA.—Correct name Lake Festinia.

L. J. DRAKE.—Note, Standard Oil Co. of New Jersey owner of vessel; station operated and controlled by Marconi Co.

MONASSES.—Correct name Manasses.

MONROLITE.—Note, Standard Oil Co. of New Jersey, owner of vessel; station operated and controlled by Marconi Co.

O. T. WARING.—Note, Standard Oil Co. of New Jersey, owner of vessel.

PLYMOUTH.—Note, Nafra Co. (Inc.), owner of vessel; station operated and controlled by Marconi Co.

SANTA OLIVIA.—Note, Atlantic & Pacific S. S. Co. owner of vessel; station operated and controlled by Marconi Co.

ST. LOUIS.—Name changed to Louisville.

TIDEWATER.—Note, Nafra Co. (Inc.) owner of vessel; station operated and controlled by Marconi Co.

YOSEMITE (WYQ).—Note, Pope & Talbot (Inc.) owner of vessel; station operated and controlled by Marconi Co.

Strike out all particulars of the following-named vessels:

Bavaria.	Lake Frunet (KEJM).	Santa Louise.
Besoeki.	Mantasket.	War Ferret.
Dubhe.	Moosabee (WCEU).	Warrior (KUY).
Goliath.	Neptune (KED).	West Canob.
Lake Farber (KECP).	Portland (WLK).	

The stations of the following-named vessels are operated and controlled by Marconi Co.:

A. C. Bedford.	Gulflight.	Sabine Sun.
Ardmore.	Gulfmaid.	Santa Ana (WBX).
Arlington.	Gulf of Mexico.	Santa Barbara.
Bacoi.	H. H. Rogers.	Santa Cecilia.
Baton Rouge.	James McGee.	Santa Luisa.
Bayway.	Jason (KNJ).	Santa Paula.
Benj. Brewster.	John D. Rockefeller.	Santa Rita (WTG).
Bradford.	Josiah Macy.	Santa Rosa.
Brandon.	Kerkenna.	Shoshone.
Brindilla.	Kerlew.	Somerset.
Caddo.	Kermoor.	Standard (KIC).
Caloria.	Ligonier.	Sucroea.
Charles Pratt.	Matinicock.	Sun.
Chester Sun.	Melrose.	Sunoil.
Chinanpa.	Mexicano.	S. V. Harkness.
Communipaw.	Mieler.	Toledo.
Corning.	Muskogee.	Trinidadian.
Cubadist.	Nelson.	Trontolite.
Dayton.	Newton.	W. C. Teagle.
De Soto.	Owego.	W. H. Tilford.
Eurana.	Paraguay.	Wico.
Everett.	Pennant.	William O'Brien.
Fred W. Weller.	Pioneer (KIG).	William G. Warden.
Glenpool.	Polarine.	
Gulfcoast.	Princeton.	

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals KCII, KECP, KED, KEJM, KKOI, KUUU, KPB, KTII, KUY, WCEU, WLK, WNN, WPG, and WQAE. KENX, *read* Clincho; KEQP *read*, Lake Festinia; KERR, *read* Benoni; KILX, *read* Manasses; KJH, *read* KJII; KSL, *read* St. Louis; and WBIA *read* Chipchung.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

Strike out all particulars following Montauk Point, Long Island, N. Y. (NVQ).

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

ARAPAHO.—Correct name Arapahoe.

GEN. R. N. BATCHELOR.—Correct name Gen. R. N. Batchelder.

MACKENZIE.—Correct name McKenzie.

O'BANNAN.—Correct name O'Bannon.

SAPALEO.—Correct name Sapelo.

Strike out all particulars of the following-named vessels:

Aphrodite.	Lake Helen.	Stewart.
Besoecki.	Lake Lasang.	S. P. 590 (Aztec).
Black Arrow.	Lake Osweya.	Sub. chaser 59.
Buitenzorg.	Lakeport.	Sub. chaser 61.
C-1.	Lake St. Regis.	Sub. chaser 81.
C-4.	Lake Superior.	Sub. chaser 83.
Dale.	Lake View.	Sub. chaser 88.
Despatch.	Lake Worth.	Sub. chaser 89.
Dubuque.	Lamson.	Sub. chaser 92.
Ed. Luckenbach.	Lydonia.	Sub. chaser 131.
Essex.	Marblehead.	Sub. chaser 151.
F. J. Luckenbach.	Marietta.	Sub. chaser 197.
Flusser.	Muscatine.	Sub. chaser 200.
Fresno.	Nahma.	Sub. chaser 227.
Fulton.	Noma.	Sub. chaser 324.
Great Northern.	Ozark.	Sub. chaser 325.
Jason.	Paysandu.	Sub. chaser 337.
Kerowlee.	Petrel.	Truxton.
Lake Benbow.	Preble.	Wainwright (NKK).
Lake Bridge.	Preston.	West Apaum.
Lake Catherine.	Rijland.	Western Front.
Lake Crescent.	Sagadahoc.	Wm. Isom.
Lake Garza.	Santa Barbara.	Willmette.
Lake Gedney.	Scranton.	Worden.
Lake Geneva.	Shoshone.	Zuiderdijk.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals NCW, NDR, NEU, NFP, NFS, NGK, NHH, NHJ, NHP, NIG, NIW, NJQ, NKH, NKX, NMP, NMV, NMY, NNB, NOZ, NQN, NQO, NTC, NUM, NUS, NVQ, NWA, NWP, NXX, NXN, NZD, NZN, NACJ, NACM, NADR, NAFJ, NAKJ, NALB, NAML, NAPZ, NAQQ, NARD, NARK, NAME, NAQG, NAVD, NAXR, NAXZ, NECC, NEDC, NEDM, NEFG, NEPJ, NEPK, NEQC, NERF, NERM, NESL, NETC, NELC, NITN, NODJ, NODL, NOFG, NOFK, NOFQ, NOFR, NOFV, NOKB, NOKX, NOMT, NOMZ, NOPL, NOVJ, NOVK, NOXB, and NUCL. NSP, *read* Arapahoe, NEVX, *read* McKenzie, NEXS, *read* O'Bannon, NUGS, *read* Sapelo and WZW, *read* Gen. R. N. Batchelder.

MISCELLANEOUS.

GOVERNMENT AND COMMERCIAL CALLS.

It will be noted that in the "List of Radio Stations of the United States" some vessels and call letters appear in the commercial and also in the Government list. The reason for this is that at the present time it is not known when they will be released from Government service. When they enter the commercial service, the commercial calls only should be used.

SUPERFLUOUS SIGNALS.

The attention of radio operators is called to regulation 209, prohibiting the transmission of superfluous signals.

The Bureau has received several reports recently of radio operators on American vessels engaging in unofficial conversation, causing unnecessary interference. Operators continuing this practice may expect the suspension or cancellation of their licenses.

EMERGENCY LICENSES AND TEMPORARY PERMITS.

Operators holding emergency licenses and temporary permits should arrange to take an examination and secure a regular license as early as possible. The holders of such licenses and permits will not be employed if regularly licensed operators are available. Operators holding second-grade licenses should endeavor to secure first-grade licenses, so as to be available for senior operators in charge of stations.

PORTS WHERE RADIO OPERATORS' EXAMINATIONS ARE HELD.

At the customhouse in Boston, New York, Baltimore, New Orleans, and San Francisco; Federal Building in Chicago and Detroit; 205 Citizens Bank Building, Norfolk; and 2301 L. C. Smith Building, Seattle.

USE OF RADIO BY VESSELS IN PORT.

Vessels docked or at anchor in harbors should not use radio for intercommunication except in urgent cases where no other quick means of communication are available, and then with reduced power, so as to avoid interference.

For short-distance communication between vessels, operators should make use of the wave lengths of 300 and 450 meters when interference may be caused on 600 meters. If this practice is followed in crowded waters much of the congestion on 600 meters will be relieved.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE.

Washington, December 1, 1919—No. 32.

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Afoundria.....	KOMG	4	4	PG	X	U. S. Shipping Board.	Owner of vessel.
Andrew Jackson.....	KONQ	4	4	PG	X	do.	Do.
Antietam.....	KONR	4	4	PG	X	do.	Marconi Co.
Ashland County.....	KOMR	4	4	PG	X	do.	Owner of vessel.
Bartholomew.....	KOMF	4	4	PG	X	do.	Do.
Basswood.....	KOQL	4	4	PG	X	do.	Do.
Bastrop.....	KOQM	4	4	PG	X	do.	Do.
Bavington.....	KOPC	4	4	PG	X	do.	Do.
Bellflower.....	KOPQ	4	4	PG	N	do.	Do.
Casey.....	KOQJ	4	4	PG	X	do.	Independent Co.
Centaurus.....	KOPZ	4	4	PG	X	do.	Owner of vessel.
Chicomoco.....	KOLS	4	4	PG	X	do.	Marconi Co.
Circinus.....	KOPK	4	4	PG	X	do.	Owner of vessel.
City of Alton.....	KONZ	4	4	PG	X	do.	Do.
Caluseus.....	KOQB	4	4	PG	X	do.	Do.
Coahoma County.....	KOMP	4	4	PG	X	do.	Do.
Coldbrook.....	KOQK	4	4	PG	X	do.	Independent Co.
Coolcha.....	KOPS	4	4	PG	X	do.	Owner of vessel.
Corvus.....	KOPL	4	4	PG	X	do.	Do.
Coskata.....	KOMZ	4	4	PG	X	do.	Do.
Cranford.....	KOLX	4	4	PG	X	do.	Do.
Cushnet.....	KONB	4	4	PG	X	do.	Do.
Cuttyhunk.....	KONC	4	4	PG	X	do.	Do.
Dannedake.....	KOPD	4	4	PG	X	do.	Do.
Detroit-Wayne.....	KONX	4	4	PG	X	do.	Do.
Deuel.....	KOMD	4	4	PG	X	do.	Kilbourne & Clark Co.
Eastern Breeze.....	KOPP	4	4	PG	X	do.	Do.
Effingham.....	KOLT	4	4	PG	X	do.	Owner of vessel.
Effna.....	KOMT	4	4	PG	X	do.	Marconi Co.
Eglantine.....	KOPT	4	4	PG	X	do.	Kilbourne & Clark Co.
Egremont.....	KOQS	4	4	PG	X	do.	Owner of vessel.
Fargo.....	KONL	4	4	PG	X	do.	Do.
Governor Forbes.....	KOQV	4	4	PG	X	do.	Do.
Hagan.....	KOQC	4	4	PG	X	do.	Do.
Hagood.....	KOQD	4	4	PG	X	do.	Do.
Henry County.....	KOMS	4	4	PG	X	do.	Do.
Indiana Bridge.....	KOND	4	4	PG	X	do.	Do.
J. R. Gordon.....	KOML					Union Sulphur Co.	Do.
Kayseeka.....	KOQS	4	4	PG	X	U. S. Shipping Board.	Do.
Kearny.....	KOPR	4	4	PG	X	do.	Do.
Kingfisher.....	KOQR					Kingfisher Co.	Do.
La Crosse.....	KONM	4	4	PG	X	U. S. Shipping Board.	Do.
Lake Fernalda.....	KOPB	4	4	PG	X	do.	Do.
Lake Elmdale.....	KOLR	4	4	PG	X	do.	Do.
Lake Elmont.....	KOQG	4	4	PG	X	do.	Do.
Lake Elsmere.....	KONT	4	4	PG	X	do.	Do.
Lake Filbert.....	KONV	4	4	PG	X	do.	Do.
Lake Fillion.....	KOPV	4	4	PG	X	do.	Do.
Lake Flattery.....	KOMC	4	4	PG	X	do.	Do.
Lake Gert.....	KOMB	4	4	PG	X	do.	Do.
Lake Getaway.....	KOLZ	4	4	PG	X	do.	Do.
Lakeside Bridge.....	KONF	4	4	PG	X	do.	Do.
Lake Strymon.....	KONS	4	4	PG	X	do.	Do.
Lansdowne.....	KONP	4	4	PG	N	do.	Do.
Lycoming.....	KOMK	4	4	PG	X	do.	Do.
Macomet.....	KORC	4	4	PG	X	do.	Do.

**COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF
VESSELS—continued.**

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South Ameri- can service.	Trans- oceanic service.				
		<i>Cents.</i>	<i>Cents.</i>				
Margus.....	KONG	4	4	PG	X	U. S. Shipping Board.	Owner of ves- sel.
Massick.....	KOPF	4	4	PG	X	do.....	Do.
Massillon Bridge.....	KONJ	4	4	PG	X	do.....	Do.
McCreary County.....	KOQP	4	4	PG	X	do.....	Do.
Minnewawa.....	KOPG	4	4	PG	X	do.....	Do.
Montague.....	KOMV	4	4	PG	X	do.....	Do.
Mopang.....	KOPX	4	4	PG	X	do.....	Do.
Nika.....	KOPM	4	4	PG	X	do.....	Do.
Nipmuc.....	KOQX	4	4	PG	N	do.....	Do.
Northwestern Bridge.....	KONK	4	4	PG	X	do.....	Do.
Paltades.....	KOLV	4	4	PG	N	do.....	Do.
Peekskill.....	KOMX	4	4	PG	N	do.....	Do.
Penguin.....	KOMJ	4	4	PG	X	do.....	Do.
Petuma.....	KOQN	4	4	PG	X	do.....	Do.
Quinnpiac.....	KOQT	4	4	PG	X	do.....	Do.
San Antonio.....	KOMN	.....	.....	.....	.....	American Finance & Commerce Co.	Do.
Scottsburg.....	KOMM	4	4	PG	N	U. S. Shipping Board.	Do.
Sioux Falls.....	KONN	4	4	PG	X	do.....	Do.
Sundance.....	KORD	4	4	PG	X	do.....	Do.
Terre Haute.....	KOPJ	4	4	PG	N	do.....	Do.
Tri Mountain.....	KOQF	4	4	PG	X	do.....	Do.
Wasagya.....	KOPN	4	4	PG	X	do.....	Marconi Co.
West Ivis.....	KOQQ	4	4	PG	X	do.....	Owner of vessel.
West Mingo.....	KORB	4	4	PG	X	do.....	Do.
Whitemarsh.....	KOMG	.....	.....	.....	.....	F. R. Payne.....	Do.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station.]

Call signal.	Name.	Call signal.	Name.
KOLR	Lake Elmdale.....b	KOPB	Lake Fernalda.....b
KOLS	Chicomoco.....b	KOPC	Bavington.....b
KOLT	Effingham.....b	KOPD	Dannedaikie.....b
KOLV	Pallsades.....b	KOPF	Massick.....b
KOLX	Cranford.....b	KOPG	Minnewawa.....b
KOLZ	Lake Getaway.....b	KOPJ	Terre Haute.....b
KOMB	Lake Gert.....b	KOPK	Circinus.....b
KOMC	Lake Flattery.....b	KOPL	Corvus.....b
KOMD	Deuel.....b	KOPM	Nika.....b
KOMF	Bartholomew.....b	KOPN	Wasagya.....b
KOMG	Whitemarsh.....b	KOPP	Eastern Breeze.....b
KOMJ	Penguin.....b	KOPQ	Bellflower.....b
KOMK	Lycoming.....b	KOPR	Kearny.....b
KOML	J. R. Gordon.....b	KOPS	Coolcha.....b
KOMM	Scottsburg.....b	KOPT	Eglantine.....b
KOMN	San Antonio.....b	KOPV	Lake Fillon.....b
KOMP	Coahoma County.....b	KOPX	Mopang.....b
KOMQ	Afoundria.....b	KOPZ	Centaurus.....b
KOMR	Ashland County.....b	KOQB	Clausens.....b
KOMS	Henry County.....b	KOQC	Hagan.....b
KOMT	Effna.....b	KOQD	Hagood.....b
KOMV	Montague.....b	KOQF	Tri Mountain.....b
KOMX	Peekskill.....b	KOQG	Lake Elmont.....b
KOMZ	Coskata.....b	KOQJ	Casey.....b
KONB	Cushnet.....b	KOQK	Coldbrook.....b
KONC	Cuttyhunk.....b	KOQL	Basswood.....b
KOND	Indiana Bridge.....b	KOQM	Bastrop.....b
KONF	Lakeside Bridge.....b	KOQN	Petunia.....b
KONG	Margus.....b	KOQP	McCreary County.....b
KONJ	Massillon Bridge.....b	KOQQ	West Ivis.....b
KONK	Northwestern Bridge.....b	KOQR	Kingfisher.....b
KONL	Fargo.....b	KOQS	Egremont.....b
KONM	La Crosse.....b	KOQT	Quinnplac.....b
KOHN	Sioux Falls.....b	KOQV	Governor Forbes.....b
KONP	Lansdowne.....b	KOQX	Nipmuc.....b
KONQ	Andrew Jackson.....b	KOQZ	Kayseeka.....b
KONR	Antietam.....b	KORB	West Mingo.....b
KONS	Lake Strymon.....b	KORC	Macomet.....b
KONT	Lake Elsmere.....b	KORD	Sundance.....b
KONV	Lake Filbert.....b		
KONX	Detroit-Wayne.....b		
KONZ	City of Alton.....b		

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[A list in the List of Radio Stations of the United States, edition of June 15, 1919.]

Name of ship.	Call.	Name of ship.	Call.
Case.....	NUNX	Nicholas.....	NUNZ
Dobbin.....	NUNR	Parrott.....	NUPD
Isherwood.....	NUNV	Putnam.....	NUPG
John D. Edwards.....	NUPC	Reuben James.....	NUNT
Lardner.....	NUPF	United States.....	NUNQ
Long Beach.....	NEFZ	Williamson.....	NUNS

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY CALLS

Call signal.	Name of ship.	Call signal.	Name of ship.
NEFZ	Long Beach.....b	NUNT	Reuben James.....t
NUPC	John D. Edwards.....b	NUNQ	United States.....b
NUPD	Parrott.....b	NUNR	Dobbin.....b
NUPF	Lardner.....b	NUNV	Isherwood.....b
NUPG	Putnam.....b	NUNX	Case.....b
NUNS	Williamson.....b	NUNZ	Nicholas.....b

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, only.]

Station.	Call signal.	Station controlled by—
Monterey, Calif.....	6XE	National Radio Co.
New Haven, Conn.....	1ZC	A. C. Gilbert Co.
San Francisco, Calif.....	6XG	National Radio Co.
San Francisco, Calif.....	6XX	Do.
San Francisco, Calif.....	6XO	Do.

WAR DEPARTMENT TRAINING AND REHABILITATION SCHOOLS.

Station.	Call signal.	Station operated by—
Ann Arbor, Mich.....	WU9	University of Michigan.
Atlanta, Ga.....	WX5	Georgia School of Technology.
Cambridge, Mass.....	WU7	Harvard University.
Cambridge, Mass.....	WX6	Massachusetts Institute of Technology.
Camp Knox, Ky.....	WY2	United States Signal Corps.
Camp Knox, Ky.....	WY3	Do.
Camp Knox, Ky.....	WY4	Do.
Camp Knox, Ky.....	WY5	Do.
Camp Knox, Ky.....	WY6	Do.
Camp Knox, Ky.....	WY7	Do.
Carlisle, Pa.....	WV7	General Hospital No. 31.
College Station, Tex.....	WU2	A. and M. College of Texas.
Denver, Colo.....	WV6	General Hospital No. 21.
Fort McHenry, Md.....	WV3	General Hospital No. 2.
Fort McPherson, Ga.....	WV4	General Hospital No. 6.
Fort Sam Houston, Tex.....	WV9	Base Hospital.
Fort Sheridan, Ill.....	WV2	General Hospital No. 28.
Hampton, Va.....	WV8	General Hospital No. 43.
Ithaca, N. Y.....	WU6	Cornell University.
Madison, Wis.....	WX3	University of Wisconsin.
Minneapolis, Minn.....	WX2	University of Minnesota.
New Haven, Conn.....	WX4	Yale University.
New York, N. Y.....	WU4	College of the City of New York.
New York, N. Y.....	WU5	Columbia University.
Oteen, N. C.....	WV5	General Hospital No. 19.
Pittsburgh, Pa.....	WU3	Carnegie Institute of Technology.
Urbana, Ill.....	WU8	University of Illinois.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude, S=south latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained.

PG=General public.

PR=Limited public.

P =Private.

O =Government business exclusively.

Hours =Hours of operation:

N =Continuous service.

X =No regular hours.

m =a. m. (12m=midday).

s =p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.

Notes =Refer to notes in the Berne list.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Bernese bureau.]

Peerless *read* Eagle.

Strike out particulars of the following-named vessels:

Dannedsaik.	Hwah Yih.	Louis Luckenbach.
Hwah Jah.	Ituna.	Northland (WCN).

The stations on the following-named vessels are controlled by the Independent Wireless Telegraph Co.:

Atlantus.	Fabyan.	Lake Frances.
Arakan.	Hanover.	Lake Onawa.
Aryan.	Inspector.	Mooseabee.
Battonville.	John M. Connelly.	Nishmaha.
Cathlamet.	Lake Ellicott.	Saranac.
Colindo.	Lake Fabulus.	Siletz.
Coquitt.	Lake Favonia.	Wawalona.
Crisfield.	Lake Flambeau.	West Selen.

The stations on the following-named vessels are controlled by the Marconi Wireless Telegraph Co.:

Bellbrook.	Kenwood Bridge.	Lake Michigan.
Brave Coeur.	Lackawanna Bridge.	Lake Stobe..
Brookwood.	Lake El Pueblo.	Northern Queen.
Bjorneford.	Lake Elrio.	Northern Wave.
Clavarack.	Lake Fariston.	Orcus.
Cold Spring.	Lake Farrar.	Salem County.
Defender.	Lake Faulk.	Sol Navis.
Effna.	Lake Figart.	Susquehanna.
Hisco.	Lake Flanders.	Suwanee.
Hog Island.	Lake Galata.	West Jaffrey.
Honolulu.	Lake Gazette.	West Saginaw.
Irvington.		

The stations on the following-named vessels are controlled by the Ship Owners' Radio Service (Kilbourne & Clark):

Anaconda.	Fort Logan.	Lake Fear.
Auditor.	Hadnot.	Lake Glasco.
Bellhaven.	Iceland.	Magmeric.
Bushrod.	Independent Bridge.	Marsodak.
Cote Blanche.	Lake Ellijay.	Montpelier.
Cripple Creek.	Lake Ellsworth.	Olockson.
Eastern Breeze.	Lake Falama.	Portsmouth.
Eglantine.	Lake Fansdale.	West Pocasset.
Escambia.	Lake Farley.	Youmachichi.
Federal Bridge.		

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KIR, *read* Eagle; strike out all particulars following the call signals KESS, KIFM, KJEO, WCN, WFI, and WPA.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

New London, Conn. (C. G. Academy), *read* New London, Conn. (Navy radio).
 Relief Light Vessel No. 72, strike out all particulars.
 Relief Light Vessel No. 78, *read* NITP.
 Relief Light Vessel No. 90, *read* NITQ.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

Kemaydin read Kewaydin.
Murvine read Mervine.
Sunnadin read Sunnadin.

Strike out all particulars of the following-named vessels:

Anderton.	Lake Weston.	S. P. 267.
Buford.	Leviathan.	S. P. 543.
Cap Finisterre.	Logan.	S. P. 666.
Carib.	Mallory.	Subchaser No. 2.
Chesapeake.	Manna Hatta.	Subchaser No. 3.
Choctaw.	Martha Washington.	Subchaser No. 189.
Edgar F. Luckenbach.	Merritt.	Subchaser No. 204.
Finland.	Mobile.	Susquehanna.
Fred Luckenbach.	Monaghan.	Tiger.
Graf Waldersee.	Newton.	West Coast.
Hazleton.	Philippines.	Western Chief.
Hisko.	Pocohontas.	West Elcasco.
Hubbard.	Pretoria.	West Gambo.
Jenkins.	Prinz Friedrich Wilhelm.	West Hobomac.
Julia Luckenbach.	Radnor.	West Humhaw.
Katrina Luckenbach.	R. J. Anderton.	West Lianga.
Koningen der Nederlanden.	Santa Malta.	West Mahomet.
Lake Bloomington.	Santa Rosa.	Zepplin.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NAXN, read Kewaydin; NEJB, read Sunnadin; NITR, read NITP; NITS, read NITQ; NRZ, read New London, Conn. (Navy radio); NUMJ, read Mervine; strike out all particulars following the call signals NCK, NEL, NEJ, NID, NIF, NKJ, NKL, NMJ, NNV, NOU, NTV, NADC, NADG, NADN, NADS, NAFD, NAFG, NAGN, NAJF, NALD, NAMP, NAQX, NARM, NASS, NATV, NAVQ, NAVZ, NAZD, NEBB, NEBD, NEBL, NEBM, NEBP, NEBT, NECQ, NEFB, NELS, NEMK, NEMR, NEND, NETP, NIVB, NIVD, NIVF, NIVG, NIVK, NIVL, NOBC, NOBD, NOMK, NONF, NUDC, NUFF, and NUJB.

MISCELLANEOUS.

AMENDMENTS.

INTERFERENCE.

Several reports have been received by the Bureau of unnecessary conversation by ship radio operators, causing serious interference.

If the investigation being made by this Bureau develops violations of section 5 of the act of August 13, 1912, appropriate action will be taken to punish the offenders.

LICENSE CANCELED.

Commercial first-grade license No. 13043, issued April 28, 1918, has been canceled because of the holder transmitting by radio obscene language.

CHANGE MADE IN STATION AT BALBOA, CANAL ZONE.

On page 88 of the List of Radio Stations of the United States, edition June 15, 1919, the last sentence of the paragraph regarding time signals transmitted by the Balboa, C. Z. station, the following should be deleted: "but so interrupted by a chopper as to be audible on a crystal detector."

UNITED STATES NAVAL RADIO COMPASS STATIONS.

In order to allow merchant vessels more time to have their transmitters tuned to the radio compass wave length of 800 meters, United States naval shore radio compass stations will continue to take bearings on the additional wave length of 600 meters until April 1, 1920. After that date all radio compass work will be conducted exclusively on the 800-meter wave length.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE.

Washington, January 2, 1920—No. 33.

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of Aug. 15, 1919) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Lost Harbor, Alaska.....	KWS	300, 550, 600	PR	X	Alaska Sulphur Co.
Saltchuck, Alaska.....	KWQ	300, 550, 600	PR	X	Hugh R. Chilberg.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Amcross.....	KOVF	4	4	PG	X	U. S. Shipping Board.	Owner of vessel.
Avalon.....	KIZL			PG	X	Hartwood Lumber Co.	Do.
Benowa.....	KOTZ	4	4	PG	X	U. S. Shipping Board.	Do.
Cethana.....	KORG	4	4	PG	X	do.....	Do.
Challamba.....	KORJ	4	4	PG	X	do.....	Do.
Chester Valley.....	KOST	4	4	PG	X	do.....	Do.
City of St. Joseph.....	KOSM	4	4	PG	X	do.....	Do.
Cliffwood.....	KORX	4	4	PG	X	do.....	Do.
Cross Keys.....	KOTD			PG	X	Teal Co.	Do.
Curlew.....	KOSZ			PG	X	Curlew Co.	Do.
Danvers.....	KOSK	4	4	PG	X	U. S. Shipping Board.	Do.
Danville.....	KOSJ	4	4	PG	X	do.....	Do.
Delanson.....	KOTX	4	4	PG	X	do.....	Do.
Dilworth.....	KOVJ	4	4	PG	X	do.....	Do.
Dryden.....	KORK	4	4	PG	X	do.....	Marconi Co.
Franklin County.....	KOTV	4	4	PG	X	do.....	Owner of vessel.
George E. Paddleford.	WIV	4	8	PG	X	Pan-American Petroleum & Transport Co.	Marconi Co.
Gulftrade.....	KOVb	4	8	PG	X	Gulf Refining Co.....	Owner of vessel.
Haleakala.....	KORL	4	4	PG	N	U. S. Shipping Board.	Independent Co.
Hancock County.....	KORT	4	4	PG	X	do.....	Owner of vessel.
Hartford.....	KOSX	4	4	PG	X	do.....	Do.
Jadden.....	KORM	4	4	PG	X	do.....	Ship Owners' Radio Service.
John Adams.....	KOSS	4	4	PG	X	do.....	Marconi Co.
John Roach.....	KOSN	4	4	PG	N	do.....	Owner of vessel.
Kenowis.....	KOSV	4	4	PG	X	do.....	Do.
Lake Elmsford.....	KOVG	4	4	PG	X	do.....	Do.
Lake Elsay.....	KOSR	4	4	PG	X	do.....	Do.
Lake Falun.....	KOTB	4	4	PG	X	do.....	Do.
Lake Fenn.....	KOTT	4	4	PG	X	do.....	Do.
Lake Slavi.....	KOTJ	4	4	PG	X	do.....	Do.
Lake Tippah.....	KOVC	4	4	PG	X	do.....	Do.
Lake Treba.....	KOSQ	4	4	PG	X	do.....	Do.
Manham.....	KORS	4	4	PG	X	do.....	Do.
Maquan.....	KOVD	4	4	PG	X	do.....	Do.
Mitchell.....	KOTF	4	4	PG	X	do.....	Do.
Monomac.....	KORP	4	4	PG	X	do.....	Do.
Monroe.....	KOSF	4	4	PG	X	do.....	Do.
Neptune.....	KORZ			PG		Mexican Fruit & S. S. Co.	Do.
Nile.....	KOSD	4	4	PG	X	U. S. Shipping Board.	Independent Co.
Nocalula.....	KORF	4	4	PG	X	do.....	Owner of vessel.
Rapidan.....	KOSG	4	4	PG	N	do.....	Marconi Co.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—
continued.

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		<i>Cents.</i>	<i>Cents.</i>				
Red Mountain.....	KOTQ	4	4	PG	X	U. S. Shipping Board.	Owner of vessel
Robin Hood.....	KOTM	4	4	PG	X	do.	Do.
Rock Island Bridge..	KORN	4	4	PG	X	do.	Do.
Sapona.....	KOSP	4	4	PG	X	do.	Do.
Teal.....	KOTC	4	4	PG	X	Teal Co.	Do.
Vinita.....	KOTL	4	4	PG	N	U. S. Shipping Board.	Do.
Vinton County.....	KORQ	4	4	PG	X	do.	Do.
West Hesseltine.....	KOTN	4	4	PG	X	do.	Do.
West Jena.....	KOTG	4	4	PG	X	do.	Do.
West Kader.....	KOSL	4	4	PG	X	do.	Do.
West Montop.....	KOTR	4	4	PG	X	do.	Do.
West Neris.....	KOTK	4	4	PG	X	do.	Do.
Widgeon.....	KOSB	4	4	PG	X	do.	Do.
Wild Duck.....	KYG	4	8	PG	X	Gulf Refining Co.	Marconi Co.
Wild Goose.....	KOTS	4	4	PG	X	Wild Goose Co. (Inc.).	Owner of vessel.
Wildwood.....	KORV	4	4	PG	X	U. S. Shipping Board.	Do.
Wisla.....	KOTP	4	4	PG	X	L. H. Mills.	Do.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KIZL	Avalon..... b	KOSX	Hartford..... b
KORF	Noccalula..... b	KOSZ	Curlew..... b
KORG	Cethana..... b	KOTB	Lake Falun..... b
KORJ	Challamba..... b	KOTC	Teal..... b
KORK	Dryden..... b	KOTD	Cross Keys..... b
KORL	Halesakala..... b	KOTF	Mitchell..... b
KORM	Jadden..... b	KOTG	West Jena..... b
KORN	Rock Island Bridge..... b	KOTJ	Lake Slavi..... b
KORP	Monomac..... b	KOTK	West Neris..... b
KORQ	Vinton County..... b	KOTL	Vinita..... b
KORS	Manham..... b	KOTM	Robin Hood..... b
KORT	Hancock County..... b	KOTN	West Hesseltine..... b
KORV	Wildwood..... b	KOTP	Wisla..... b
KORX	Cliffwood..... b	KOTQ	Red Mountain..... b
KORZ	Neptune..... b	KOTR	West Montop..... b
KOSB	Widgeon..... b	KOTS	Wild Goose..... b
KOSD	Nile..... b	KOTT	Lake Fenn..... b
KOSF	Monroe..... b	KOTV	Franklin County..... b
KOSG	Rapidian..... b	KOTX	Delanson..... b
KOSJ	Danville..... b	KOTZ	Benowa..... b
KOSK	Danvers..... b	KOVB	Gulftrade..... b
KOSL	West Kader..... b	KOVC	Lake Tippih..... b
KOSM	City of St. Joseph..... b	KOVD	Maquan..... b
KOSN	John Rosch..... b	KOVF	Ameross..... b
KOSP	Sapona..... b	KOVG	Lake Elmsford..... b
KOSQ	Lake Treba..... b	KOVJ	Dilworth..... b
KOSR	John Elsieh..... b	KWQ	Saltchuck, Alaska..... c
KOSS	John Adams..... b	KWS	Lost Harbor, Alaska..... c
KOST	Chester Valley..... b	KYG	Wild Duck..... b
KOSV	Kenqwis..... b		

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Bache.....	NLK	McGourty.....	NEJV
Bothwell.....	NEKD	Mahalatos.....	NIDL
Boyce.....	NISD	Natoma.....	NUGG
Carr.....	NEXP	Oveson.....	NIZD
Coghlan.....	NUPK	Pathfinder.....	NLJ
Converse.....	NAPM	Pequot.....	NUPJ
Cook.....	NIGT	Quigley.....	NIDB
Cygan.....	NICP	Richards.....	NIDG
Earp.....	NEKF	Scally.....	NEKC
Isis.....	NQA	Sicard.....	NUPL
Johansson.....	NIQP	Smith.....	NIXG
Klingelhoef.....	NISC	Stellenwerf.....	NIDC
Knudsen.....	NEXL	Taylor.....	NITB
Larsen.....	NITK	Tingard.....	NISB
Lydonia.....	NDR		

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919. c=land station; b=ship station.]

Call signal.	Name of station.	Call signal.	Name.
NDR	Lydonia.....b	NISB	Tingard.....b
NAPM	Converse.....b	NISC	Klingelhoef.....b
NEJV	McGourty.....b	NISD	Boyce.....b
NEKC	Scally.....b	NITB	Taylor.....b
NEKD	Bothwell.....b	NITK	Larsen.....b
NEKF	Earp.....b	NIXG	Smith.....b
NEXP	Carr.....b	NIZD	Oveson.....b
NEXL	Knudsen.....b	NLJ	Pathfinder.....b
NICP	Cygan.....b	NLK	Bache.....b
NIDB	Quigley.....b	NQA	Isis.....b
NIDC	Stellenwerf.....b	NUGG	Natoma.....b
NIDG	Richards.....b	NUPJ	Pequot.....b
NIDL	Mahalatos.....b	NUPK	Coghlan.....b
NIGT	Cook.....b	NUPL	Sicard.....b
NIQP	Johansson.....b		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, only.]

Station.	Call signal.	Station controlled by—
Auburn, Ala.....	5XA	Alabama Polytechnic Institute.
Bala, Pa.....	3ZA	Charles A. Service, jr.
Clinton, Md.....	3XE	W. W. Conners.
Franklinton, La.....	5ZK	Paul Ellis Greenlaw.
Jackson, Tenn.....	5YB	Young Men's Christian Association.
Little Rock, Ark.....	5ZL	John M. Clayton.
Montclair, N. J.....	2XS	Adams Morgan Co.
Providence, R. I.....	1XF	Electrical Products Manufacturing Co.
Roselle Park, N. J.....	2XR	Marconi Wireless Telegraph Co. of America.
Roswell, N. Mex.....	5ZA	Louis Falconi.
Salt Lake City, Utah.....	6ZA	Ira Johnston Kaar.
San Francisco, Calif.....	6XJ	Otis B. Moorhead.
San Francisco, Calif.....	6XP	Moorhead Laboratories (Inc.).
Schenectady, N. Y.....	2XQ	Union College.
Waco, Tex.....	5ZJ	Henry M. Harris.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XF	First district: Providence, R. I.	5XA	Fifth district: Auburn, Ala.
2XQ	Second district: Schenectady, N. Y.	5YB	Jackson, Tenn.
2XR	Roselle Park, N. J.	5ZA	Roswell, N. Mex.
2XS	Montclair, N. J.	5ZJ	Waco, Tex.
3XE	Third district: Clinton, Md.	5ZK	Franklin, La.
3ZA	Bala, Pa.	5ZL	Little Rock, Ark.
		6XJ	Sixth district: San Francisco, Calif.
		6XP	San Francisco, Calif.
		6ZA	Salt Lake City, Utah.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude, S=south latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P =Private.

O =Government business exclusively.

Hours =Hours of operation:

N =Continuous service.

X =No regular hours.

m =a. m. (12m=midday).

s =p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ADMIRAL EVANS.—Pacific Steamship Co. owner of vessel; station operated and controlled by Ship Owners' Radio Service.

ADMIRAL RODMAN.—Pacific Steamship Co. owner of vessel.

ADMIRAL SEBREE.—Pacific-Alaska Navigation Co. owner of vessel; station operated and controlled by Ship Owners' Radio Service.

ADMIRAL SIMS.—Pacific-Alaska Navigation Co. owner of vessel.

AGRISTA.—Correct name Agarista.

AGWIDALE.—Mallory Steamship Co. owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.

AGWISTAR.—Mallory Steamship Co. owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.

ABELLE.—Nacirema Steamship Corporation owner of vessel.

ALCONQUIN.—Clyde Steamship Co. owner of vessel; station operated and controlled by Marconi Co.

- ALPENA.—Wyandotte Transportation Co. owner of vessel.
 AMABALA.—Correct name Alabama; station operated and controlled by Independent Wireless Telegraph Co.
 ANDREA F. LUCKENBACH.—Luckenbach Steamship Co. owner of vessel; station operated and controlled by Ship Owners' Radio Service.
 ARGENTA.—Nacirema Steamship Corporation owner of vessel; station operated and controlled by Marconi Co.
 ASHBURN.—Nacirema Steamship Corporation owner of vessel; station operated and controlled by Marconi Co.
 BOBBING.—Pacific-American Fisheries Corporation owner of vessel.
 BRYNHILDA.—Cosmopolitan Shipping Co. owner of vessel.
 BUCKHANNON.—Robinson Shipping Co. owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
 CALLAO.—Bark Callao Corporation owner of vessel.
 CALVERAS.—Correct name Calaveras.
 CAPE LOOKOUT.—Name changed to Kosciuszko.
 CATANINA.—Fisher G. Jones owner of vessel.
 CAUTO.—Atlantic, Gulf & West Indies Line owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
 CHAMPION.—Atlantic Transport Co. owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
 CHICOMOCO.—Correct name Chicomico.
 CHINANPA.—Correct name Chinampa.
 CHINCHA.—Green Star Steamship Corporation owner of vessel.
 CITY OF EVERETT.—Standard Oil Co. of New York owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
 CLIO.—Pacific-American Fisheries owner of vessel.
 COLUMBIA.—New Orleans & South American Steamship Co. owner of vessel.
 COMMISSIONER.—Merritt & Chapman Derrick & Wrecking Co. owner of vessel; station operated and controlled by Ship Owners' Radio Service.
 COYOTE.—American Steamship Corporation, owner of vessel.
 DALAGADA.—Correct name Dalgada.
 DALANA.—Nacirema Steamship Corporation, owner of vessel.
 DEEPWATER.—Castner, Curran & Bullitt, owner of vessel; station operated and controlled by Marconi Co.
 DEERFIELD.—El Dorado Steamship Co., owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
 DEERLODGE.—Correct name Deer Lodge.
 DEFENDER.—Atlantic Transport Co., owner of vessel.
 DOCHRA.—Barber & Co., owner of vessel.
 DONORA.—Name changed to Orleans; Orleans Steamship Corporation owner of vessel; station operated and controlled by Marconi Co.
 E. C. POPE.—Inter-Coast Steamship Co., owner of vessel.
 ELDORADO.—Western Transport Co., owner of vessel.
 ENDICOTTE.—Correct name Endicott.
 EOCENE.—Standard Oil Co. of New York, owner of vessel.
 FIRE ISLAND.—American Northern, Norway & West Indies Steamship Co., owner of vessel; station operated by Marconi Co.
 F. J. LUCKENBACH.—Luckenbach Steamship Co., owner of vessel; station operated and controlled by Ship Owners' Radio Service.
 FLORENCE LUCKENBACH.—Luckenbach Steamship Co., owner of vessel; station operated and controlled by Ship Owners' Radio Service.
 FLORENCE OLSON.—Oliver J. Olson, owner of vessel.
 FORDONIAN.—American-Mediterranean Steamship Co., owner of vessel.
 FRANCIS L. SKINNER.—H. F. Ostrander, owner of vessel; station operated and controlled by Ship Owners' Radio Service.
 GENE CRAWLEY.—Sinclair Gulf Corporation, owner of vessel; station operated and controlled by Marconi Co.
 GEO. H. JONES.—Standard Oil Co. of New Jersey, owner of vessel; station operated and controlled by Marconi Co.
 GLEN WHITE.—Castner, Curran & Bullitt, owner of vessel; station operated and controlled by Marconi Co.
 GOSPORT.—Name changed to Orient.
 GOVERNOR.—Pacific Steamship Co., owner of vessel.
 GRATIA.—Gratia Navigation Co., owner of vessel.

- GULF QUEEN.**—Gulf Refining Co., owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- HARRY FAENUM.**—Sinclair Gulf Corporation; station operated and controlled by Marconi Co.
- HERBERT L. PRATT.**—Atlantic Refining Co., owner of vessel.
- H. F. DIMOCK.**—Eastern Steamship Corporation, owner of vessel.
- H. M. WHITNEY.**—Whitney Steamship Co., owner of vessel.
- HOLLYWOOD.**—Hollywood Steamship Corporation, owner of vessel.
- HORACE X. BAXTER.**—Horace X. Baxter Steamship Co., owner of vessel.
- HORADO.**—Nacirema Steamship Corporation, owner of vessel; station operated and controlled by Marconi Co.
- HUACHUCA.**—Orinoco Steamship Corporation, owner of vessel; station operated and controlled by Marconi Co.
- HUMBOLDT.**—James Jerome, owner of vessel.
- IDELL.**—Name changed to City of Freeport.
- IPSWICH.**—Shawmut Steamship Co., owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- ISABELA.**—Station operated and controlled by Marconi Co.
- ITOMPA.**—Nacirema Steamship Corporation, owner of vessel; station operated and controlled by Marconi Co.
- JAMES S. WHITNEY.**—Acme Steamship Corporation owner of vessel.
- JAMES TIMPSON.**—Resolved Corporation owner of vessel.
- J. C. DONNELL.**—Atlantic Refining Co. owner of vessel.
- J. E. O'NEIL.**—Atlantic Refining Co. owner of vessel; station operated and controlled by Ship Owners' Radio Service.
- KANABEC.**—Kanabec Steamship Co. owner of vessel.
- KATHERINE.**—Philippine Vegetable Oil Co. owner of vessel; station operated and controlled by Marconi Co.
- KATRINA LUCKENBACH.**—Edgar F. Luckenbach owner of vessel.
- KERESAN.**—American Ship & Commerce Navigation Corporation owner of vessel; station operated and controlled by Marconi Co.
- KERESASPA.**—American Ship & Commerce Navigation Corporation owner of vessel; station operated and controlled by Marconi Co.
- KERLEW.**—American Ship & Commerce Navigation Corporation owner of vessel; station operated and controlled by Marconi Co.
- KERMANSIAH.**—American Ship & Commerce Navigation Corporation owner of vessel; station operated and controlled by Marconi Co.
- KERMOOR.**—American Ship & Commerce Navigation Corporation owner of vessel; station operated and controlled by Marconi Co.
- KEROWLEE.**—American Ship & Commerce Navigation Corporation owner of vessel; station operated and controlled by Marconi Co.
- KERWOOD.**—American Ship & Commerce Navigation Corporation owner of vessel; station operated and controlled by Marconi Co.
- K. I. LUCKENBACH.**—Edgar F. Luckenbach owner of vessel; station operated and controlled by Ship Owners' Radio Service.
- LAKE MOHONK.**—Astoria Mahogany Co. owner of vessel; station operated and controlled by Ship Owners' Radio Service.
- LAKE ONEIDA.**—Astoria Mahogany Co. owner of vessel; station operated and controlled by Ship Owners' Radio Service.
- LANSING.**—Union Steamship Co. owner of vessel.
- LASSELL.**—Lassell Steamship Co. owner of vessel.
- LEWIS LUCKENBACH.**—Luckenbach Steamship Co. owner of vessel; station operated and controlled by Ship Owners' Radio Service.
- LIBERTY.**—United States & Australasia Line owner of vessel; station operated and controlled by Ship Owners' Radio Service.
- LOUISVILLE.**—Name changed to St. Louis.
- LYDIA.**—Station operated and controlled by Marconi Co.
- MACONA.**—Barber & Co. owner of vessel.
- MANASSES.**—Correct name Monasses.
- MANCHURIA.**—Atlantic Transport Co. owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- MARINA.**—Bull-Insular Line owner of vessel; station operated and controlled by Marconi Co.
- MARUBA.**—Inter-Coast Steamship Co. owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- MAZAMA.**—American Steamship Corporation owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.

- MERIDON.**—Correct name Meriden.
- MIWAUKEE.**—Grand Trunk Car Ferry Line owner of vessel; station operated and controlled by Marconi Co.
- MINEOLA.**—Atlantic & Pacific Steamship Co. owner of vessel; station operated and controlled by Marconi Co.
- MINNESOTA.**—Atlantic Transport Co. owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- MULTNOMAH.**—Multnomah Steamship Co. owner of vessel.
- MYSTIC.**—Shawmut Steamship Co. owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- NAVAHOE.**—Trans-Oceanic Shipping Co. owner of vessel.
- NAWITKA.**—Nacirema Steamship Corporation owner of vessel; station operated and controlled by Marconi Co.
- NEHALEM.**—Pacific Mercantile Marine Co. owner of vessel; station operated and controlled by Marconi Co.
- NESHAMING.**—Correct name Neshaminy.
- NEW BRITAIN.**—Great Northwestern Shipping Corporation owner of vessel; station operated and controlled by Marconi Co.
- NIKA.**—Hodge Steamship Co. owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- NORTHLAND.**—(WGJ) Albers Bros. Milling Co. owner of vessel; station operated and controlled by Ship Owners' Radio Service.
- NORTH PINES.**—North Pines Steamship Co. owner of vessel; station operated and controlled by Marconi Co.
- OREGON.**—Henry Wilson owner of vessel.
- OYAKA.**—States Steamship Corporation owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- PANUCO.**—(KMM) Sinclair Gulf Corporation owner of vessel.
- PANUCO.**—(KWM) Station operated and controlled by Independent Wireless Telegraph Co.
- PARTHIAN.**—Olympia Shipping Corporation owner of vessel.
- PATHFINDER.**—David Weldner owner of vessel; station operated and controlled by Marconi Co.
- PERFECTION.**—Standard Oil Co. of New York owner of vessel.
- PHYLLIS.**—Phyllis Steamship Co. owner of vessel.
- PLYMOUTH.**—Green Star Steamship Corporation owner of vessel.
- POINT ADAMS.**—Pacific Mail Steamship Co. owner of vessel.
- POINT BONITA.**—Pacific Mail Steamship Co. owner of vessel.
- POINT JUDITH.**—Pacific Mail Steamship Co. owner of vessel.
- POINT LOBOS.**—Pacific Mail Steamship Co. owner of vessel.
- QUITTICAS.**—Correct name Quittacas.
- RADIANT.**—Standard Oil Co. of New York owner of vessel.
- RAYO.**—Standard Oil Co. of New York owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- REBECCA PALMER.**—S. de Barrenechea owner of vessel.
- RED CLOUD.**—French-American Line owner of vessel; station operated and controlled by Marconi Co.
- REDONDO.**—(KYT) Redondo Steamship Co. owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- RICHMOND BORO.**—Williams Steamship Co. owner of vessel; station operated and controlled by Marconi Co.
- ROBERT M. THOMPSON.**—American Transportation Co. owner of vessel.
- ROMAN.**—French-American Line owner of vessel; station operated and controlled by Marconi Co.
- ROSE MAHONEY.**—Andrew F. Mahony owner of vessel; correct name Rose Mahony.
- RUBY.**—American Transportation Co. owner of vessel.
- RUTH E. MERRILL.**—Olympia Shipping Corporation owner of vessel.
- SACRAMENTO.**—Sacramento Steamship Co. owner of vessel; station operated and controlled by Marconi Co.
- SANAEELISA.**—Correct name, Santa Elisa.
- SAN ANTONIO.**—Adolfo Stahl, owner of vessel.
- SAXON.**—Clinchfield Navigation Co., owner of vessel.
- S. B. HUNT.**—Standard Oil Co. of New Jersey, owner of vessel; station operated and controlled by Marconi Co.
- SEGURANCA.**—Standard Commercial Steamship Corporation, owner of vessel.

- SHOSHONE**.—American Interlake Co. (Inc.), owner of vessel; station operated and controlled by Marconi Co.
- STANWOOD**.—Stanwood Steamship Line, owner of vessel.
- STRATHNAVER**.—Name changed to American Star.
- SUNBEAM**.—Sun Co., owner of vessel.
- SUNSHINE**.—Sun Co., owner of vessel.
- SUBUGA**.—Barber & Co., owner of vessel.
- TAMESI**.—Sinclair Gulf Corporation, owner of vessel; station operated and controlled by Marconi Co.
- TASCO**.—Name changed to Bonita.
- THALA**.—Nacirema Steamship Corporation, owner of vessel; station operated and controlled by Marconi Co.
- TOLLARD**.—United States Transport Co., owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- VANADA**.—United States Transport Co., owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- VESTA**.—Standard Oil Co. of New York, owner of vessel.
- VIGO**.—Arthur A. Miller, owner of vessel.
- WAHKEENA**.—Wahkeena Steamship Co., owner of vessel.
- WALTER HARDCASTLE**.—Sinclair Gulf Corporation, owner of vessel; station operated and controlled by Marconi Co.
- WAPAMA**.—Wapama Steamship Co., owner of vessel.
- WASHTENAW**.—Union Steamship Co., owner of vessel.
- WEST CATANACE**.—El Dorado Steamship Co., owner of vessel; station operated and controlled by Independent Wireless Telegraph Co.
- WHITTIER**.—T. A. Hays, owner of vessel.
- WILLIAM GREEN**.—Pan-American Petroleum & Transport Co., owner of vessel.
- WILLIAM ISOM**.—American-Italian Commercial Corporation, owner of vessel.
- WILLIAM N. PAGE**.—Castner, Curran & Bullitt, owner of vessel; station operated and controlled by Marconi Co.
- WILLIMANTIC**.—Station operated and controlled by Marconi Co.
- WINDING GULF**.—Castner, Curran & Bullitt, owner of vessel.
- WINNEBAGO**.—American Transatlantic Co., owner of vessel.
- WISCONSIN BRIDGE**.—French-American Line, owner of vessel; station operated and controlled by Marconi Co.
- WISTARIA**.—Correct name, Wisteria; Foreign & Domestic Transportation Corporation, owner of vessel.
- W. M. BURTON**.—Atlantic Refining Co., owner of vessel.
- W. M. IRISH**.—Atlantic Refining Co., owner of vessel.
- XENIA**.—Foreign & Domestic Transportation Corporation, owner of vessel; station operated and controlled by Marconi Co.
- YAKLOW**.—Correct name, Yaklok.
- YAPHANK**.—Name changed to Willpolo; station operated and controlled by Marconi Co.
- YEHAMA**.—Archibald L. Stark, owner of vessel.
- ZAVALLA**.—Nacirema Steamship Corporation, owner of vessel; station operated and controlled by Marconi Co.

The stations of the following-named vessels are operated and controlled by the Independent Wireless Telegraph Co.:

Antilla.	Gulfoil.	Northwestern (KUO).
Bayamo.	Gulfstream.	Pennsylvania.
Beatrice.	Helen.	Sabine.
Brabant.	Henry R. Mallory.	Sagua.
Camaguey.	J. M. Guffey.	San Jacinto.
Campello.	Larimer.	Santiago.
Comal.	Louisiana.	Socony.
Concho.	Matanzas.	Susquehanna.
Cornelia.	Medina.	Tanamo.
Currier.	Mexico.	Texas (KUM).
Esperanza.	Mongolia.	Virginia (KUV).
Georgia (KUR).	Monterey.	Winifred.
Guantanamo.	Morro Castle.	
Gulfland.	New York (KUW).	

The stations of the following-named vessels are operated and controlled by the Marconi Wireless Telegraph Co.:

Astral.	Grecian.	Nelson.
Benjamin Brewster.	Gulfport.	Norman Bridge.
Borinquen.	Harold Walker.	North Land (KJD).
Brammel Point.	Herbert G. Wylie.	Ontario.
Broad Arrow.	Howard.	Paul H. Harwood.
Bylayl.	Howick Hall.	Paulsboro.
C. A. Canfield.	Huron (KVH).	Pearl Shell.
Calvin Austin.	Hyades.	Pere Marquette 8.
Carolinian.	Iroquois.	Persian.
Central American.	J. B. Stetson.	Ponce.
Charles Braley.	J. M. Danziger.	Quantic.
Charles E. Harwood.	Jonancy.	Robert P. Clark.
Charles M. Everest.	Juniata (KQJ).	Royal Arrow.
China.	Kershaw.	San Juan (KGJ).
City of Alpena II.	Lenape.	Santa Alicia.
City of Detroit II.	Lurline.	Santa Clara.
City of Mackinac II.	Mangore.	Santa Flavia.
City of St. Ignace.	Mariana.	Santa Inez.
Coamo.	Matoa.	Santa Isabel.
Colusa.	Matsonia.	Santa Rita.
Comet.	Maul.	Santore.
Craster Hall.	Merrimack.	Santurce.
Cretan.	Mohawk.	Satsuma.
Dorchester.	Mount Rainier.	Silver Shell.
Edward L. Doheny, Jr.	Munaires.	S. M. Spaulding.
Essex.	Munabro.	Standard Arrow.
F. D. Asche.	Munamar.	Sudbury.
Firmore.	Mundale.	Suffolk.
F. Q. Barstow.	Mundelta.	Sylvan Arrow.
Frederic R. Kellogg.	Munindies.	Tiger.
Freeman.	Munplace.	Walter D. Munson.
Freeport Sulphur No. 1.	Munrio.	Western States.
George G. Henry.	Munsomo.	Westwego.
Geo. W. Barnes.	Munwood.	Wilhelmina.
Gloucester.	Nanking.	Windber.
Governor Cobb.	Nantucket.	
Governor Dingley.	Natenna.	

The stations of the following-named vessels are operated and controlled by the Ship Owners' Radio Service (Inc.):

Abner Coburn.	Edellyn.	Pleiades.
Admiral Dewey.	Edgar F. Luckenbach.	Rainier.
Admiral Farragut.	Edward Luckenbach.	Redondo (WBM).
Admiral Goodrich.	Fred'k. Luckenbach.	Redwood.
Admiral Nicholson.	Frieda.	Relief.
Admiral Schley.	Hattie Luckenbach.	Rescue.
Admiral Wainwright.	Jefferson (WAJ).	Santa Ana (WAL).
Admiral Watson.	J. L. Luckenbach.	Severance.
Alameda.	Julia Luckenbach.	Sol Navis.
Alaska.	Juneau.	South Bend.
Allaguash.	Ketchikan.	Stanley Dollar.
Anyox.	Latouche.	Starr.
Ausable.	Libby-Maine.	Valdez.
Benjamin F. Packard.	Manitowoc.	Victoria.
Catherine D.	Marica.	Walter A. Luckenbach.
Chicago.	Maryanne.	W. F. Burrows.
Cordova.	Northwestern (WAN).	Zapora.
Cricket.	Norwood.	

Strike out all particulars of the following-named vessels:

Albert Watts.	Banicaa.	Batino.
Alushan.	Barias.	Beaver.
Ammonoosuc.	Barnstable.	Bedloe.

Beechland.	Govan.	Oceland.
Benvola.	Harney.	Palta.
Betterton.	Harsteele.	Pamaway.
Bidwell.	Hiddenite.	Peru.
Bolina.	Huron.	Plave.
Bustamente.	Irtysch.	Polar Land.
Canton.	Istas.	R. L. Barnes.
Carmen.	J. A. Chanslor.	Rosewood.
Cecil County.	Jim Butler.	Roy H. Beattie.
Clio (KCUE).	Juno.	Sagamore.
Coolspring.	Kanakanak.	Santa Catalina.
Corydon.	Kinta.	Texas (WBOE).
Dania.	Majave.	Tyee (WSIO).
Danville.	Milton.	Wacha.
Daram.	Mount Hood.	Wilcox.
Evelyn.	Nahaska.	Yaklok (WSUO).
Firwood.	Nasket.	Zudie.
Fort White.	North Star.	
George W. Elder.	Oakwood.	

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KEDC, *read* Dalgada; KESV, *read* City of Freeport; KIDZ, *read* Orleans; KIGQ, *read* Santa Elisa; KIGX, *read* Yaklok; KILN, *read* Neshaminy; KILP, *read* Meriden; KILX, *read* Monasses; KIMD, *read* Deer Lodge; KIPP, *read* American Star; KLUU, *read* Agarista; KOBM, *read* Willpolo; KODN, *read* Endicott; KOJN, *read* Wisteria; KOLC, *read* Orient; KOLS, *read* Chicomico; KFT, *read* Bonita; KSC, *read* Chinampa; KSL, *read* St. Louis; KXIE, *read* Calaveras; KZUE, *read* Kosciuszko; WRAE, *read* Alabama; and WRUO *read* Quittacas. Strike out all particulars following the call signals, KCUE, KECD, KEFG, KEJC, KEQF, KEQZ, KERB, KERC, KERV, KERZ, KESQ, KEST, KETB, KEW, KGU, KJS, KMAE, KNEO, KNUE, KQAE, KQUI, KREU, KSUE, KVQ, KXOO, WBC, WBEU, WBIE, WBOE, WBOI, WCH, WCK, WFIE, WGEO, WGIU, WGOA, WIL, WIP, WJUE, WKUA, WKUE, WKUO, WLAO, WLP, WMAU, WMIE, WPAO, WPAU, WPEE, WPEI, WPEO, WPEU, WPOA, WQAA, WRK, WRT, WSB, WSH, WSIO, WSOA, WSUO, WTK, WWB, and WWJ.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

Ingram *read* Ingram Osmond; Ranger *read* NUDG. Strike out all particulars of the following-named vessels:

Active.	Imperator.	Santa Ana.
Adams.	Iowan.	Santa Olivia.
Aeolus.	J. B. Hinton.	Sea Gate.
Agamemnon.	Lake Daraga.	Siboney.
Alleen.	Lenape.	South Bend.
Alaskan.	Madawaska.	S. P. 411 (Sussanne).
Ancon.	Matsonia.	S. P. 572 (Long Island).
Arabia.	Minnesotan.	S. P. 582 (Halcyon II).
Askawake.	Mongolia.	Theodore Roosevelt.
Blue Ridge.	Morristown.	Virginian.
Calamares.	Northern Pacific.	Wanderer.
City of South Haven.	Old Dominion.	West Bridge.
Dakotan.	Orizaba.	West Harcuvar.
De Kalb.	Osaqumsick.	West Hematite.
Eagle 20.	Panaman.	West Hembrie.
Edward L. Doheny III.	Patricia.	West Henshaw.
Etin.	Puritan.	West Maximus.
Floridian.	Quincy.	West Modus.
Freedom.	Rainier.	W. F. Babcock.
Harrisburg.	San Luis.	Zeelandia.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NIGF, *read* Ingram Osmond, NUDG, *read* Ranger. Strike out all particulars following the call signals, NBE, NOT, NDS, NEB, NEE, NEF, NEZ, NGQ, NKI, NNS, NSB, NTI, NTJ, NUO, NVO, NZM, NABK, NACF, NAFM, NAGF, NAKF, NAKG, NAKP, NALX, NANF, NAPC, NARL, NASZ, NATC, NATX, NATZ, NAVB, NAVC, NAVJ, NAVP, NAXG, NAXP, NAZG, NEBX, NEDR, NEDT, NEFN, NEFP, NEFR, NEGQ, NEKC, NENQ, NEPN, NEPP, NEPR, NEQG, NEVJ, NUBN, NUBV, NUCB, NUGZ, NUKN, NUKG, NIVC, NIVN.

MISCELLANEOUS.

DISTRESS CALLS.

When radio calls for assistance are received from vessels in distress, Coast Guard cutters promptly proceed, whenever possible, to render aid. There have been instances recently when vessels that had sent out radio calls for help, which were responded to by Coast Guard cutters, have failed to annul their distress calls when assistance was no longer needed. Under such circumstances the Coast Guard cutter needlessly consumes fuel, and the effect upon the personnel is discouraging when they eventually learn that their strenuous efforts to reach the endangered craft were not necessary and were occasioned solely by the failure of the vessel to advise them that she was no longer in need of help.

Any vessel that has sent out a call for assistance should annul such call immediately when assistance is no longer needed.

ADDITIONAL COPIES

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE.

Washington, February 2, 1920—No. 34.

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of Aug. 15, 1919) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Pirate Cove, Alaska.....	KOXN	.....	.....	.....	Union Fish Co.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Abercos.....	KOVR	4	4	PG	X	U. S. Shipping Board.	Owner of vessel.
Aeolus.....	KOZC	4	4	PG	X	do.	Do.
Agememnon.....	KOXQ	4	4	PG	X	do.	Do.
Bearport.....	KUBK	4	4	PG	X	do.	Do.
Betterton.....	KUBG	4	4	PG	X	do.	Do.
City of Alma.....	KUBP	4	4	PG	X	do.	Do.
City of Berkeley.....	KOZQ	4	4	PG	X	do.	Do.
City of Miami.....	WDI	.....	.....	PG	X	do.	Do.
City of Omaha.....	KOZB	4	4	PG	X	U. S. Shipping Board.	Do.
Claremont.....	KUBD	.....	.....	PG	X	W. H. Wood.	Do.
Clarksburg.....	KOVP	4	4	PG	X	U. S. Shipping Board.	Radio Corporation of America.
Coelleda.....	KOVV	4	4	PG	X	do.	Owner of vessel.
Cœur d'Alene.....	KOVT	4	4	PG	X	do.	Do.
Cold Harbor.....	KUBB	4	4	PG	X	do.	Do.
Collamer.....	KOZZ	4	4	PG	X	do.	Do.
Culburra.....	KOZR	4	4	PG	X	do.	Do.
E. A. Morse.....	KOVN	4	4	PG	X	do.	Do.
Elfay.....	KOVQ	.....	.....	.....	.....	Russell A. Alger.	Do.
Haslehurst.....	KOXB	4	4	PG	X	U. S. Shipping Board.	Do.
I. J. Merritt.....	KOVZ	.....	.....	PG	X	Merritt & Chapman	Do.
						Derrick & Wrecking Co.	
Lake Elmwood.....	KOZT	4	4	PG	X	U. S. Shipping Board.	Do.
Lake Fandango.....	KOVL	4	4	PG	X	do.	Do.
Lake Fandon.....	KOVS	4	4	PG	X	do.	Do.
Laramie.....	KUBC	4	4	PG	X	do.	Do.
Liberty Minquas.....	KUBJ	4	4	PG	X	do.	Do.
Minooka.....	KOZN	4	4	PG	X	do.	Do.
Miskianza.....	KOZM	4	4	PG	X	do.	Do.
Moravia Bridge.....	KOZG	4	4	PG	X	do.	Do.
Norumbega.....	KOZX	4	4	PG	X	do.	Do.
Pawlet.....	KUBL	4	4	PG	X	do.	Do.
Quaker City.....	KOZL	4	4	PG	X	do.	Do.
Roanoke.....	KOXV	.....	.....	PG	X	Texas Co.	Do.
Robin Adair.....	KOVM	4	4	PG	X	U. S. Shipping Board.	Ship Owners' Radio Service (Inc.).
Robin Goodfellow.....	KUBN	4	4	PG	X	do.	Owner of vessel.
Robin Gray.....	KOXT	4	4	PG	X	do.	Ship Owners' Radio Service (Inc.).
Rockport.....	KOZD	4	4	PG	X	do.	Owner of vessel.
San Diego.....	KUBF	.....	.....	PG	.....	W. H. Wood.	Do.
Sapelo.....	KOVK	4	4	PG	X	U. S. Shipping Board.	Do.
St. Anthony.....	KUBM	4	4	PG	X	do.	Do.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—
continued.

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
Steel Age.....	KOXZ	Cents. 4	Cents. 8	PG	.....	U. S. Steel Products Co.	Owner of vessel.
Steelmaker.....	KOXX	4	8	PG	.....	do.	Do.
Suwied.....	KOXC	4	4	PG	X	U. S. Shipping Board.	Do.
Tampa.....	KOVX	4	4	PG	X	do.	Do.
Tampico.....	KOXR	4	8	PG	.....	Crowell & Thurlow.	Do.
Tashmoo.....	KOXD	4	4	PG	X	U. S. Shipping Board.	Do.
Tekoa.....	KOXF	4	4	PG	X	do.	Do.
Tenally.....	KOZF	4	4	PG	X	do.	Do.
Toledo Bridge.....	KOXG	4	4	PG	X	do.	Do.
Tona.....	KOXJ	4	4	PG	X	do.	Do.
Tonesit.....	KOXX	4	4	PG	X	do.	Do.
Tuladi.....	KOXL	4	4	PG	X	do.	Do.
Vigilant.....	KOZP	4	8	PG	.....	E. K. Wood Lumber Co.	Do.
Vincennes Bridge.....	KOXM	4	4	PG	X	U. S. Shipping Board.	Do.
Von Steuben.....	KOXP	4	4	PG	X	do.	Do.
West Hilar.....	KOZK	4	4	PG	X	do.	Do.
West Ivan.....	KOZS	4	4	PG	X	do.	Do.
West Jessup.....	KOXS	4	4	PG	X	do.	Do.
West Nigar.....	KOZJ	4	4	PG	X	do.	Do.
Wilcox.....	WPAO	4	4	PG	X	do.	Independent Co.
Wm. Henry Webb.....	KOZV	4	4	PG	X	do.	Owner of vessel.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; c—land station.]

Call signal.	Name.	Call signal.	Name.
KOVK	Sapelo..... b	KOZD	Rockport..... b
KOVL	Lake Fandango..... b	KOZF	Tenally..... b
KOVM	Robin Adair..... b	KOZO	Moravia Bridge..... b
KOVN	E. A. Morse..... b	KOZJ	West Nigar..... b
KOVP	Clarksburg..... b	KOZK	West Hilar..... b
KOVQ	Elkay..... b	KOZL	Quaker City..... b
KOVR	Abercree..... b	KOZM	Miskatlan..... b
KOVS	Lake Fandon..... b	KOZN	Minooka..... b
KOVT	Coeur D'Alene..... b	KOZP	Vigilant..... b
KOVV	Coelelda..... b	KOZQ	City of Berkeley..... b
KOVX	Tampa..... b	KOZR	Culburra..... b
KOVZ	I. J. Merritt..... b	KOZS	West Ivan..... b
KOXB	Hastehurst..... b	KOZT	Lake Elmwood..... b
KOXC	Suwied..... b	KOZV	Wm. Henry Webb..... b
KOXD	Tashmoo..... b	KOZX	Norumbega..... b
KOXF	Tekoa..... b	KOZZ	Collamer..... b
KOXG	Toledo Bridge..... b		
KOXJ	Tona..... b	KUBB	Cold Harbor..... b
KOXX	Tonesit..... b	KUBC	Laramie..... b
KOXL	Tuladi..... b	KUBD	Claremont..... b
KOXM	Vincennes Bridge..... b	KUBF	San Diego..... b
KOXN	Pirate Cove, Alaska..... c	KUBG	Betterton..... b
KOXP	Von Steuben..... b	KUBJ	Liberty Minquas..... b
KOXQ	Agememnon..... b	KUBK	Bearport..... b
KOXR	Tampico..... b	KUBL	Pawlet..... b
KOXS	West Jessup..... b	KUBM	St. Anthony..... b
KOXT	Robin Gray..... b	KUBN	Robin Goodfellow..... b
KOXV	Roanoke..... b	KUBP	City of Alma..... b
KOXX	Steelmaker..... b		
KOXC	Steel Age..... b	WDI	City of Miami..... b
KOZB	City of Omaha..... b	WPAO	Wilcox..... b
KOZC	Acotus..... b		

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Quincy.....	NGQ		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, only.]

Station.	Call signal.	Station controlled by—
Agriculture College, Miss.....	5YD	Mississippi Agricultural & Mechanical College.
Austin, Tex.....	5ZU	Wesley H. Tilley.
Baudette, Minn.....	9ZC	John A. Gjellhaug.
Bloomington, Ill.....	9YS	Illinois Wesleyan University.
Boise, Idaho.....	7YA	Independent School District of Boise City.
Cambridge, Mass.....	1XJ	Harvard University.
Canton, Ohio.....	8ZV	*Henry L. Ley.
Cincinnati, Ohio.....	8XB	*Precision Equipment Co.
Cleveland, Ohio.....	8XF	Emil J. Simon.
Defiance, Ohio.....	8ZY	*K. A. Duerk.
Detroit, Mich.....	8XD	Emil J. Simon.
Elk, Wyo.....	7ZE	Harold P. Sheard.
Glenridge, N. J.....	2XV	Western Electric Co.
Houston, Tex.....	5ZO	Clifford W. Vick.
Houston, Tex.....	5ZT	Ingham S. Roberts III.
Indianapolis, Ind.....	9ZJ	Francis F. Hamilton.
Lincoln, Nebr.....	9YY	University of Nebraska.
Los Altos, Calif.....	6XY	National Radio Co.
Los Angeles, Calif.....	6XQ	Southern California Edison Co.
Manitowoc, Wis.....	9ZL	*H. J. Burhop and W. C. Bridges.
Manlius, N. Y.....	8YB	St. John's School.
Minneapolis, Minn.....	9ZT	Minnesota Wireless Association.
New Orleans, La.....	5YC	Nola Radio School.
New Orleans, La.....	5ZP	Herbert E. De Ben.
New York, N. Y.....	2YB	B. B. Brownlee.
Oakland, Calif.....	6XX	St. Mary's College.
Oelwein, Iowa.....	9ZQ	George R. Hammond.
Ossining, N. Y.....	2XX	De Forest Radio Telephone & Telegraph Co.
Palo Alto, Calif.....	6XV	Federal Telegraph Co.
Schenectady, N. Y.....	2XY	Wallace L. Brooks.
South Orange, N. J.....	2ZC	Henry L. Leeb.
University, Miss.....	5YE	University of Mississippi.
University Place, Nebr.....	9YD	Nebraska Wesleyan University.
Washington, D. C.....	8XF	Francis M. Beer.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XJ	First district: Cambridge, Mass.	7YA	Seventh district: Boise, Idaho.
2XV	Second district: Glenridge, N. J.	7ZE	Elk, Wyo.
2XY	Schenectady, N. Y.	8XB	Eighth district: Cincinnati, Ohio.
2XX	Ossining, N. Y.	8XD	Detroit, Mich.
2YB	New York, N. Y.	8XF	Cleveland, Ohio.
2ZC	South Orange, N. J.	8YB	Manlius, N. Y.
3XF	Third district: Washington, D. C.	8ZV	Canton, Ohio.
5YC	Fifth district: New Orleans, La.	8ZY	Defiance, Ohio.
5YD	Agricultural College, Miss.	9YD	Ninth district: University Place, Nebr.
5YE	University, Miss.	9YS	Bloomington, Ill.
5ZO	Houston, Tex.	9YY	Lincoln, Nebr.
5ZP	New Orleans, La.	9ZC	Baudette, Minn.
5ZT	Houston, Tex.	9ZJ	Indianapolis, Ind.
5ZU	Austin, Tex.	9ZL	Manitowoc, Wis.
6XQ	Sixth district: Los Angeles, Calif.	9ZQ	Oelwein, Iowa.
6XV	Palo Alto, Calif.	9ZT	Minneapolis, Minn.
6XX	Oakland, Calif.		
6XY	Los Altos, Calif.		

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude, S=south latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P =Private.

O =Government business exclusively.

Hours =Hours of operation:

N =Continuous service.

X =No regular hours.

m =a. m. (12m=midday).

s =p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

ALTERATIONS AND CORRECTIONS.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ANCON.—U. S. Shipping Board owner of vessel.

ASTMAHCO III.—Astmahco No. 3 (Inc.) owner of vessel.

CALLABASAS.—Atlantic Fruit Co. owner of vessel.

CAMPELLO.—Robinson Shipping Co. owner of vessel.

CENTAURUS.—Nafra Co. (Inc.) owner of vessel.

CETHANA.—J. E. Chilberg owner of vessel.

CHALLAMBA.—J. E. Chilberg owner of vessel.

CHAMPION.—Atlantic Transport Co. owner of vessel.

CIRCINUS.—Nafra Co. (Inc.) owner of vessel.

CALUSEUS.—Nafra Co. (Inc.) owner of vessel.

COOLCHA.—J. E. Chilberg owner of vessel.

CORVUS.—Nafra Co. (Inc.) owner of vessel.

COTE BLANCHE.—U. S. Shipping Board owner of vessel.

CROSS KEYS.—U. S. Shipping Board owner of vessel.

DELCO.—Delco S. S. Co. owner of vessel.

EURANA.—Green Star S. S. Corporation owner of vessel.

G. A. FLAGG.—Adam E. Cornelius owner of vessel.

GOVERNOR FORBES.—Caribbean S. S. Co. owner of vessel.

LAKE MOHONK.—Name changed to Astmahco III.

LAKE ONEIDA.—Name changed to Astmahco IV.

LANCASTER.—Imperial Shipping Corporation owner of vessel.

OLEAN.—Name changed to C. A. Snider.

PATHFINDER.—Universal Transportation Co. (Inc.) owner of vessel.

PETUNIA.—Foreign & Domestic Transportation Corporation owner of vessel.

SANTA CECILIA.—Green Star S. S. Corporation owner of vessel.

SHOSHONE.—Name changed to Manoa.

SIERRA (KQHP).—Green Star S. S. Corporation owner of vessel.

TACONY.—Bluefields Fruit & S. S. Co. (Inc.) owner of vessel.

TIDEWATER.—Green Star S. S. Corporation owner of vessel.

Toledo.—American Sugar Refining Co. owner of vessel.

WEST CADDEW.—Correct name West Caddoa.

WEST GALATA.—Correct name Lake Galata.

WEST ISLAY.—Imperial Shipping Corporation owner of vessel.

WEST POINT.—Neptune Line (Inc.) owner of vessel.

The stations of the following-named vessels are operated and controlled by the Independent Wireless Telegraph Co.:

Amoron.	Hoven.	Massillon Bridge.
Bakersfield.	Imlay.	Mendora.
Bascobel.	Itanca.	Monomac.
Bellemina.	Kayseeka.	Montague.
Bellflower.	Lake Capens.	Moosehausic.
Bethelbridge.	Lake Charlotte.	Mopang.
Bird City.	Lake Dancey.	Newton.
Buffalo Bridge.	Lake Ellerslie.	Nipmuc.
Callao.	Lake Ellithorpe.	Owatama.
Casey.	Lake Fackler.	Oyaka.
Chickasaw.	Lake Fairlie.	Parksville.
Clark Mills.	Lake Fanquier.	Peekskill.
Coldbrook.	Lake Fernando.	Putnam.
Cross Keys.	Lake Fife.	Santa Malta.
Daniel Webster.	Lake Fisher.	Sundance.
Deroche.	Lake Flagstaff.	Tollard.
Dewey.	Lake Girardeau.	Waban.
Diana.	Lake Girth.	Wachusett.
Egremont.	Lakeside Bridge.	West Hassayampa.
Epitacio Pessoa.	Lockport.	West Ivis.
Gulftrade.	Luella.	West Jena.
Himoto.	Manhan.	West Neris.

The stations of the following-named vessels are operated and controlled by the Radio Corporation of America:

Amcross.	Delfina.	Lake Flattery.
Antietam.	Dillwyn.	Lake Gebhart.
Babboosic.	Effingham.	Lake Strymon.
Barthney.	Elkhorn.	Lake Wilson.
Bartholomew.	Fort George.	Lansdowne.
Bartolome.	Freedom.	Lyncoming.
Bavington.	Gray Cloud.	Lynchburg.
Bellerose.	Hartford.	Maquan.
Ben Salem.	Hathaway.	Margus.
Braeburn.	Hoosac.	Minnewawa.
Buttonwood.	Hulaco.	Nocalula.
Chepadoa.	Indiana Bridge.	Nokatay.
Chicomico.	John Roach.	Ophis.
Clackamas.	Kaweah.	Palisades.
Clara.	Kootenai.	Radnor.
Continental Bridge.	Lake Elmhurst.	Wakiki.
Cook.	Lake Faxon.	West Bridge.
Dannedaie.	Lake Felden.	West Ira.
Dauperata.	Lake Fiscus.	

The stations of the following-named vessels are operated and controlled by the Ship Owners' Radio Service (Inc.):

Abraham Lincoln.	Democracy.	Merry Mount.
Afoundria.	Deuel.	Munra.
Andrew Jackson.	Dilworth.	Nockum.
Arcadia.	Endicott.	Nonantum.
Bellepline.	Firthcliffe.	Philippines.
Byfield.	Fort Russell.	Quinnipiac.
Cape Henry.	Gaffney.	Rockaway Park.
Chester Valley.	Jacksonville.	Scottsburg.
City of Alton.	Labette.	Terre Haute.
Cliffwood.	Lafcomo.	Tri Mountain.
Clodia.	Lake Conesus.	Tuwetanka.
Coahoma County.	Lake Elon.	West Heselntine.
Cockaponset.	Lake Fagundus.	West Kader.
Coskata.	Lake Gitano.	West Katan.
Cushnet.	Lake St. Clair.	West Mingo.
Cuttyhunk.	Liberator.	West Montop.
Delco.	Massick.	Wildwood.
Delisle.		

Strike out all particulars of the following-named vessels:

Abrigada.	Eten.	Liberty Glo.
Anna.	Kerwood.	Pelican.
Belvedere.	Lake Conway.	Yehama.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KOQ, *read* Manoa; KODF, *read* West Caddoa; KOJJ, *read* Lake Galata; KRR, *read* C. A. Snider; WDF, *read* Astmahco IV; WGB, *read* Astmahco III. Strike out all particulars following the call signals KEQT, KIQZ, KIRL, KLIO, KNIE, KVAU, KVVU, WPM, and WJD.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

Strike out all particulars of the following-named stations:

Benton Harbor, Mich; Brunswick, Ga.; Dry Tortugas, Fla.; Ensenada, P. R.; Fort Morgan, Ala. (NHB); and Koko Head, Hawaii.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

U-B-148 *read* U-148.

Strike out all particulars of the following-named vessels:

Eagle 16.	S. P. 328 (Margaret).	Sub-chaser No. 183.
Eagle 21.	S. P. 333 (Kenneth L. Mc-	Sub-chaser No. 198.
Eagle 22.	Neal).	Sub-chaser No. 199.
Eagle 24.	S. P. 416 (P. A. H. Hub-	Sub-chaser No. 233.
Eagle 30.	bard).	Sub-chaser No. 234.
Harbor Tug No. 59	S. P. 439 (Kanised).	Sub-chaser No. 274.
Harbor Tug No. 60.	S. P. 510 (Suzanne).	Sub-chaser No. 279.
Harbor Tug No. 62.	S. P. 525 (Chilhowee).	Sub-chaser No. 280.
Harbor Tug No. 66.	S. P. 563 (Magnet).	Sub-chaser No. 281.
Harbor Tug No. 85.	S. P. 581 (Xarifa).	Sub-chaser No. 302.
H. Luckenbach.	S. P. 585 (Helianthus).	Sub-chaser No. 311.
Hcpkins.	S. P. 599 (Akbar).	Sub-chaser No. 312.
Kaiserin Auguste Victoria.	S. P. 617 (Yacona).	Sub-chaser No. 333.
Kwasind.	S. P. 691 (Mansfield).	Sub-chaser No. 334.
Lawrence.	S. P. 812 (Carola IV).	Sub-chaser No. 335.
Marietta.	S. P. 967 (Admiral).	Sub-chaser No. 405.
McDonough.	S. P. 1240 (Seneca).	Sub-chaser No. 410.
Santa Clara.	Sub-chaser No. 18.	Sub-chaser No. 414.
Santa Elena.	Sub-chaser No. 20.	Sub-chaser No. 415.
Santa Paula.	Sub-chaser No. 22.	Sub-chaser No. 417.
Smith.	Sub-chaser No. 27.	Sub-chaser No. 435.
S. P. 34 (Whitecap).	Sub-chaser No. 38.	Sub-chaser No. 442.
S. P. 103 (Raven III).	Sub-chaser No. 82.	Sub-chaser No. 445.
S. P. 206 (Alacrity).	Sub-chaser No. 132.	Sub-chaser No. 446.
S. P. 210 (Helenita).	Sub-chaser No. 139.	Sub-chaser No. 447.
S. P. 238 (Wacondah).	Sub-chaser No. 152.	Sub-chaser No. 448.
S. P. 269 (Tillamook).	Sub-chaser No. 153.	W. A. Luckenbach.
S. P. 311 (Onward).	Sub-chaser No. 155.	

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NERD, *read* U-148. Strike out all particulars following the call signals, NCP, NDX, NHB, NHC, NIY, NJH, NJQ, NNO, NNP, NOS, NPM, NSQ, NUF, NYZ, NZX, NALF, NANK, NASF, NAVT, NEFX, NEJV, NEKD, NEKF, NEKJ, NELJ, NEXP, NIRD, NIRF, NIRG, NIRJ, NIQP, NIQZ, NIVJ, NIVM, NOBK, NOBM, NOBP, NOBV, NOCD, NOFJ, NOKC, NOKM, NOKZ, NOLB, NOLD, NOMB, NOMV, NOMX, NOPS, NOPT, NORX, NOSF, NOSG, NOSJ, NOTM, NOTZ, NOVB, NOVT, NOVJ, NOVX, NOXZ, NOZF, NOZL, NOZM, NOZP, NUBD, NUBJ, NUBQ, NUBZ, NUCM, NUCN, NUCP, NUDN, NUDP, NUDV, NUDZ, NUDX, NUFC, NUFJ, NUFK, NUJC, NUKQ, NUKR, NUKZ, NULB, NULC, NUNP.

MISCELLANEOUS.

LOSS OF OPERATOR'S LICENSES.

The Bureau is receiving an unusually large number of requests for duplicates of lost radio operators' licenses. In a number of cases the loss of the license is apparently due to carelessness, and in the future where this is evident the Bureau will withhold the issuance of a duplicate for at least 30 days.

RANGE OF AMATEUR STATIONS.

On January 21 the Bureau received a radiogram from an amateur radio station in Hartford, Conn., which was sent direct to an amateur station in Washington, using a wave length of 200 meters. This indicates the range of such stations on a 200-meter wave length when the apparatus is efficient.

CHANGE OF MARCONI CO.

The Radio Corporation of America now operates and controls all stations formerly operated and controlled by the Marconi Wireless Telegraph Co. of America.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, March 1, 1920—No. 35

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of Aug. 15, 1919) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Becharof, Alaska.....	KUDV		PR	X	Alaska Packers' Association.
Belmar, N. J. (see New Brunswick, N. J.).....					
Bolinas, Calif.....	KET	6,700	PR	N	Radio Corporation of America.
Brooklyn, N. Y.....	WCG	300, 600	PG	X	International Radio Telegraph Co.
Burwood, La.....	WBW	300, 600	PG-PR	X	Tropical Radio Telegraph Co.
Chatham, Mass. (see Marion, Mass.).....					
Chisik Island, Alaska.....	KUCP		PR	X	Surf Packing Co.
Cleveland, Ohio.....	WCX		PR		Inter-City Radio Co.
Detroit, Mich.....	WDR		PR		Do.
Jamaica, N. Y.....	WSK		PG	N	E. J. Simon.
Koggiung ¹	KUBX				
Kahuku, Hawaii.....	KIE	9,000	PR	N	Radio Corporation of America.
Koko Head (see Kahuku).....					
Marion, Mass.....	WSO	12,000	PR	N	Do.
Marshall, Calif. (see Bolinas, Calif.).....					
New Brunswick, N. J.....	WII	13,600	PR	N	Do.
New London, Conn.....	WLC	300, 600	PG	X	International Radio Telegraph Co.
New Orleans, La.....	WNU	300, 600	PG-PR	X	Tropical Radio Telegraph Co.
Newport, R. I.....	WCI	300, 600	PG	X	International Radio Telegraph Co.
New York, N. Y.....	WHB		PR		Inter-City Radio Co.
Pilot Point, Alaska.....	KUDT				Alaska Packers' Association.

¹ Permanently moored scow in the Koggiung River, also known as Kvichak River.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
American Press.....	KUDN	4	4	PG	X	U. S. Shipping Board.	Radio Corporation of America.
Argon.....	KUDD			PG	X	Standard Transportation Co.	Owner of vessel.
Boobyalla.....	KUGC			PG	X	U. S. Shipping Board.	Do.
Boynton.....	KUGF	4	4	PG	X	East Coast Fisheries Co.	Do.
Brant.....	KUDB			PG	X	U. S. Shipping Board.	Independent Co.
Cajacet.....	KUDI	4	4	PG	N	U. S. Shipping Board.	Owner of vessel.
Cartona.....	KUFL	4	4	PG	X	do.	Ship Owners' Radio Service.
City of Alameda.....	KUCQ	4	4	PG	X	do.	Do.
City of Flint.....	KUCV	4	4	PG	X	do.	Owner of vessel.
City of Sherman.....	KUCS	4	4	PG	X	do.	Do.
Clearwater.....	KUGD	4	4	PG	X	do.	Do.
Clemence C. Morse.....	KUGG	4	4	PG	N	do.	Do.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—continued.

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Clontarf.....	KUDP	4	4	PG	X	U. S. Shipping Board.	Ship owners' Radio Service.
Coldwater.....	KUCX	4	4	PG	X	do.	Do.
Corone.....	KUFM	4	4	PG	X	do.	Owner of vessel.
Davenport.....	KUDR	4	4	PG	X	do.	Do.
Dellwood.....	KUBZ	4	4	PG	X	do.	Do.
Des Moines Bridge.....	KUCG	4	4	PG	X	do.	Do.
Eastern Gale.....	KUDZ	4	4	PG	N	do.	Ship Owners' Radio Service.
Eastern Guide.....	KUCN	4	4	PG	X	do.	Owner of vessel.
Eastern Knight.....	KUFB	4	4	PG	X	do.	Independent Co.
Eastern Mariner.....	KUGB	4	4	PG	X	do.	Owner of vessel.
Eastern Moon.....	KUDX	4	4	PG	X	do.	Radio Corporation of America.
Great Falls.....	KUFK	4	4	PG	X	do.	Owner of vessel.
Heron.....	KUDF			PG	X	East Coast Fisheries Co.	Do.
Higho.....	KUBV	4	4	PG	X	U. S. Shipping Board.	Radio Corporation of America.
Holyoke Bridge.....	KUCJ	4	4	PG	X	do.	Owner of vessel.
Indiana Harbor.....	KUBS	4	4	PG	X	do.	Do.
Lake Elva.....	KUBR	4	4	PG	X	do.	Do.
Lake Elwin.....	KUDM	4	4	PG	X	do.	Do.
Lake Feodora.....	KUBT	4	4	PG	X	do.	Do.
Lake Fillmore.....	KUCZ	4	4	PG	X	do.	Do.
Lake Floravista.....	KUFC	4	4	PG	X	do.	Do.
Lake Florian.....	KUFD	4	4	PG	X	do.	Do.
Lake Floris.....	KUFF	4	4	PG	X	do.	Do.
Lake Flournoy.....	KUFG	4	4	PG	X	do.	Do.
Lake Giddings.....	KUCR	4	4	PG	X	do.	Do.
Lake Ikatan.....	KUCM	4	4	PG	X	do.	Do.
Lake Rushville.....	KUDS	4	4	PG	X	do.	Do.
Long Island.....	KUFV	4	4	PG	X	do.	Independent Co.
Loon.....	KUGJ			PG	X	East Coast Fisheries Co.	Owner of vessel.
Matatlan.....	KUBQ			PG	X	California-Mexico S.S. Co.	Do.
Mehanno.....	KUDJ	4	4	PG	X	U. S. Shipping Board.	Radio Corporation of America.
New England.....	KUCB	4	4	PG	X	do.	Owner of vessel.
Ossa.....	KUFZ	4	4	PG	X	do.	Do.
Plover.....	KUFT			PG	X	East Coast Fisheries Co.	Do.
Plow City.....	KUCC	4	4	PG	X	U. S. Shipping Board.	Do.
Riverside Bridge.....	KUCD	4	4	PG	X	do.	Do.
Salinas.....	KUCL	4	4	PG	N	do.	Do.
Sheldrake.....	KUFX			PG	X	East Coast Fisheries Co.	Do.
Snipe.....	KUFS			PG	X	do.	Do.
Steel Voyager.....	KUFN			PG	N	U. S. Steel Products Co.	Do.
Tern.....	KUFQ	4	4	PG	X	East Coast Fisheries Co.	Owner of vessel.
Transfer No. 17.....	KUCT			PG	X	New Haven R. R. Co.	Do.
Tuscan.....	KUDC			PG	X	Munson S. S. Line.	Independent Co.
Virginia Bridge.....	KUCF	4	4	PG	X	U. S. Shipping Board.	Owner of vessel.
Wauwatosa.....	KUCK	4	4	PG	X	do.	Do.

**COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—
continued.**

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
West Cadron.....	KUDK	<i>Cents.</i> 4	<i>Cents.</i> 4	PG	X	U. S. Shipping Board.	Ship Owners' Radio Service.
West Campgaw.....	KUFR	4	4	PG	X	do.....	Owner of vessel.
West Himrod.....	KUDQ	4	4	PG	X	do.....	Ship Owners' Radio Service.
West Jester.....	KUDG	4	4	PG	X	do.....	Independent Co.
West Nilus.....	KUFJ	4	4	PG	X	do.....	Ship Owners' Radio Service.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; c—land station.]

Call signal.	Name.	Call signal.	Name.
KET	Bolinas, Calif. (transmitting).....c	KUDS	Lake Rushville.....b
KIE	Marshall, Calif. (receiving).....c	KUDT	Pilot Point, Alaska.....c
KUBQ	Kahuku, Hawaii (transmitting).....c	KUDV	Becharof, Alaska.....c
KUBR	Koko Head, Hawaii (receiving).....c	KUDX	Eastern Moon.....b
KUBS	Mazatlan.....b	KUDZ	Eastern Gale.....b
KUBT	Lake Elva.....b	KUFB	Eastern Knight.....b
KUBV	Indiana Harbor.....b	KUFC	Lake Floravista.....b
KUBX	Lake Feodora.....b	KUFD	Lake Florian.....b
KUBZ	Higlo.....b	KUFF	Lake Floris.....b
KUCB	Koggiung (moored scow).....c	KUFG	Lake Flournoy.....b
KUCC	Dellwood.....b	KUFJ	West Nilus.....b
KUCD	New England.....b	KUFG	Great Falls.....b
KUCF	Plow City.....b	KUFL	Cartona.....b
KUCG	Riverside Bridge.....b	KUFM	Corone.....b
KUCJ	Virginia Bridge.....b	KUFN	Steel Voyager.....b
KUCK	Des Moines Bridge.....b	KUFQ	Tern.....b
KUCL	Holyoke Bridge.....b	KUFR	West Campgaw.....b
KUCM	Wauwatosa.....b	KUFS	Snipe.....b
KUCN	Salinas.....b	KUFT	Plover.....b
KUCP	Lake Ikatan.....b	KUFV	Long Island.....b
KUCQ	Eastern Guide.....b	KUFX	Sheldrake.....b
KUCR	Chisik Island, Alaska.....c	KUFZ	Ossa.....b
KUCS	City of Alameda.....b	KUGB	Eastern Mariner.....b
KUCT	Lake Giddings.....b	KUGC	Boobyalla.....b
KUCV	City of Sherman.....b	KUGD	Clearwater.....b
KUCW	Transfer No. 17.....b	KUGF	Boynton.....b
KUCX	City of Flint.....b	KUGG	Clemence C. Morse.....b
KUCZ	Coldwater.....b	KUGJ	Loon.....b
KUDB	Lake Fillmore.....b	WBW	Burrwood, La.....c
KUDC	Brant.....b	WCG	Brooklyn, N. Y.....c
KUDD	Tuscan.....b	WCI	Newport, R. I.....c
KUDF	Argon.....b	WCX	Cleveland, Ohio.....c
KUDG	Heron.....b	WDR	Detroit, Mich.....c
KUDJ	West Jester.....b	WHB	New York, N. Y.....c
KUDK	Mehanno.....b	WII	New Brunswick, N. J. (transmitting).....c
KUDL	West Cadron.....b	WLC	Belmar, N. J. (receiving).....c
KUDM	Cajacet.....b	WNU	New London, Conn.....c
KUDN	Lake Elwin.....b	WSK	New Orleans, La.....c
KUDP	American Press.....b	WLO	Jamaica, N. Y.....c
KUDQ	Clontarf.....b		Marion, Mass. (transmitting).....c
KUDR	West Himrod.....b		Chatham, Mass. (receiving).....c
	Davenport.....b		

SPECIAL COMMERCIAL SHIP STATION.

Call letters KUPF have been awarded to the Bethlehem Ship-building Corporation for a portable set which is placed on board ships built by them at San Francisco for the United States Navy. This set is used only during the trial trip of a vessel.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Bird Island, Calif. ¹	NLD	U. S. Navy.
Brooks, Alaska.....	WUV	U. S. Signal Corps, War Department.
Camp Vail, N. J. ²	WEBB	Do.
Camp Vail, N. J. ²	WEBC	Do.
Camp Vail, N. J. ²	WEBD	Do.
Camp Vail, N. J. ²	WEBF	Do.
Camp Vail, N. J. ²	WEBG	Do.
Cattle Point, Wash. ¹	NFN	U. S. Navy.
Fort Stevens, Oreg. ¹	NZS	Do.
Honolulu, Hawai ¹	WZH	U. S. Signal Corps, War Department.
Iditarod, Alaska.....	WXL	Do.
McGrath, Alaska.....	WXV	Do.
New Dungeness, Wash. ¹	NFT	U. S. Navy.
Point Fermin, Calif. ¹	NPX	Do.
Point Hueneme, Calif. ¹	NMD	Do.
Point Montara, Calif. ¹	NLH	Do.
Point Reyes, Calif. ¹	NLG	Do.
Port Angeles, Calif. ¹	NFT	Do.
Smith Island, Wash. ¹	NFH	Do.
Tientsin, China.....	WYX	U. S. Army.
West Port, Wash. ¹	NHL	U. S. Navy.

¹ Radio compass station.

² Tractor.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Ausburne.....	NUPR	Bulmer.....	NUPN
Billingsley.....	NUPQ	Despatch.....	NIDF
Bruce.....	NUPS	Edsall.....	NUPM

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; c—land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NFH	Smith Island, Wash. ¹.....c	NUPQ	Billingsley.....b
NFN	Cattle Point, Wash. ¹.....c	NUPR	Ausburne.....b
NFT	New Dungeness, Wash. ¹.....c	NUPS	Bruce.....b
NFT	Port Angeles, Wash. ¹.....c	WEBB	Camp Vail, N. J. ².....c
NHL	West Port, Wash. ¹.....c	WEBC	Camp Vail, N. J. ².....c
NLD	Bird Island, Calif. ¹.....c	WEHD	Camp Vail, N. J. ².....c
NLG	Point Reyes, Calif. ¹.....c	WEBF	Camp Vail, N. J. ².....c
NLH	Point Montara, Calif. ¹.....c	WEBG	Camp Vail, N. J. ².....c
NMD	Point Hueneme, Calif. ¹.....c	WUV	Brooks, Alaska.....c
NPX	Point Fermin, Calif. ¹.....c	WXL	Iditarod, Alaska.....c
NZS	Fort Stevens, Oreg. ¹.....c	WXV	McGrath, Alaska.....c
NIDF	Despatch.....b	WYX	Tientsin, China.....c
NUPM	Edsall.....b	WZH	Honolulu, Hawai ¹.....c
NUPN	Bulmer.....b		

¹ Radio compass station.

² Tractor.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, only.]

Station.	Call signal.	Station controlled by—
Auberry, Calif.....	6XR	San Joaquin Light & Power Corporation.
Cochise, Ariz.....	6ZC	Dr. J. B. Ellis.
Lawrence, Kans.....	9YN	University of Kansas.
Lexington, Ky.....	9YB	University of Kentucky.
Oakland, Calif.....	6XC	National Radio Co.
San Francisco, Calif.....	6ZE	D. B. McGown.
Sioux City, Iowa.....	9ZU	Sioux City Radio Laboratory.
St. Louis, Mo.....	9ZV	James Albert Crowder.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
6XC	Sixth district:	9YB	Ninth district:
6XR	Oakland, Calif.	9YN	Lexington, Ky.
6ZC	Auberry, Calif.	9ZU	Lawrence, Kans.
6ZE	Cochise, Ariz.	9ZV	Sioux City, Iowa.
	San Francisco, Calif.		St. Louis, Mo.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude, S=south latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P =Private.

O =Government business exclusively.

Hours =Hours of operation:

N =Continuous service.

X =No regular hours.

m =a. m. (12m=midday).

s =p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

LARSEN BAY, ALASKA.—Name changed to Uyak, Alaska.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

AVALON.—W. H. Wood owner of vessel.

BENOWA.—J. E. Chilberg owner of vessel.

CLARA.—(WJH) Name changed to Krakow.

CLARKSBURG.—Coastwise Transportation Co. owner of vessel.

DANVILLE.—U. S. Shipping Board owner of vessel; station operated and controlled by Radio Corporation of America.

EL DIA.—Station operated and controlled by owner of vessel.

EL SIGLO.—Station operated and controlled by owner of vessel.

G. A. FLAGG.—Boland and Cornelius owner of vessel.

MAZAMA.—Mazama Steamship Co. owner of vessel.

MINEOLA.—Grace Steamship Co. owner of vessel.

NOSHICO.—Moshico correct name; station operated and controlled by Radio Corporation of America.

ORLEANS.—Orleans Steamship Corporation owner of vessel.

RED CLOUD.—Red Cloud Steamship Co. owner of vessel.

ROBIN GRAY.—Robin Line Steamship Co. owner of vessel.

SAN RAMON.—Mexican Fruit & Steamship Corporation owner of vessel.

SANTA RITA.—(WTG) American Fuel Oil & Transportation Co. owner of vessel.

SANTA TECLA.—Grace Steamship Co. owner of vessel.

SUNOIL.—Station operated and controlled by owner of vessel.

TACONY.—Name changed to Jamaica; Jamaica Navigation Co. owner of vessel.

TOLEDO.—Name changed to Dulcino.

WISLA.—Polish-American Navigation Corporation owner of vessel.

The stations of the following-named vessels are operated and controlled by the Independent Wireless Telegraph Co.:

Banicaa.	Lake Fithian.	Shenandoah.
Champion.	Manchuria.	Siboney.
City of Omaha.	Maruba.	Suwied.
City of St. Joseph.	Millinocket.	Tenafly.
Cranford.	Minnesota (WMI).	Toledo Bridge.
Defender.	Noccalula.	Tonesit.
Edith (KZF).	Nacogdoches.	Vanada.
Lake Elsmere.	Norumbega.	Wacouta.
Lake Fairfax.	Orizaba.	William M. Mills.

The stations of the following-named vessels are operated and controlled by the Radio Corporation of America (formerly Marconi Co.):

City of Berkeley.	Kenowis.	Northwestern Bridge.
Coellada.	Knights Island.	Pawlet.
Collamer.	Lake Elmdale.	Red Mountain.
Delanson.	Lake Flatonia.	Tekoa.
Eastern Merchant.	Macomet.	West Ivan.
Eastern Moon.	Minooka.	West Jessup.
Edna.	Miskianza.	West Niger.
Higbo.	Mitchell.	Wonahbe.

The stations of the following-named vessels are operated and controlled by the Ship Owners' Radio Service:

Abercos.	Florence Luckenbach.	Robin Goodfellow.
Bearport.	Hagan.	Rockport.
Betterton.	Kearney.	Sapona.
City of Alameda.	Lake Elsinore.	St. Anthony.
City of Alma.	Lake Ferrona.	Tuladi.
City of Miami.	Lakehurst.	Waterbury.
Coeur D'Alene.	Laramie.	Wekika.
Cold Harbor.	Lewis Luckenbach.	West Cadron.
Eastern Gale.	Liberty Minquas.	Wm. Henry Webb.
Elfay.	Northland (WGJ).	Wyandotte (WJW).
F. J. Luckenbach.	Quaker City.	

Strike out all particulars of the following-named vessels:

Brookland.	Macona.	Pathfinder.
Catania.	Marne.	Princess Anne.
Larimer.	Mielero.	

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KHA, *read* Uyak, Alaska; KOBX, *read* Moshico; KTV, *read* Dulcino; WJH, *read* Krakow; WLB, *read* Jamaica; strike out all particulars following the call signals KEDJ, KEVQ, KFC, KGY, KNT, KOB, KTA, and WTI.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

Strike out all particulars of the following-named stations:

Light Vessel No. 9, Hedge Fence, Mass.
Light Vessel No. 23, Ram Island Reef, Conn.
University of Florida.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

Gen. S. B. Holabird.—Call letters WYV.
Sub. chaser 240.—Strike out all particulars.
Sub. chaser 411.—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

WYV, *read* Gen. S. B. Holabird; strike out all particulars following the call signals NARX, NATD, NOZG, NOZS, and NUGC.

SPECIAL LAND STATIONS BY NAMES OF STATIONS.

Agricultural College, N. Dak. (North Dakota Agricultural College) call letters 9YC
Lafayette, Ind. (Purdue University) call letters 9YB.

MISCELLANEOUS.

EXECUTIVE ORDER.

Whereas, pursuant to authority of Executive orders of April 6, 1917, and April 30, 1917, certain radio systems and stations and rights connected therewith were taken over by the Government and certain restrictions were placed on the operation of other radio systems and stations;

I, Woodrow Wilson, President of the United States of America, do hereby authorize order, and direct as follows:

All radio stations taken over by the Government of the United States and now held by it under authority of Executive orders of April 6 and April 30, 1917, respectively

including all systems, lines, and property taken possession of or received, operated, supervised, or controlled under authority of said Executive Orders shall, at midnight on the 29th day of February instant, be returned and delivered to the respective owners thereof.

All restrictions placed under authority of said Executive orders of April 6 and April 30, 1917, on all radio stations not necessary to the Government for naval communications shall be removed, to take effect at midnight on the 29th day of February instant, from which time the control and operation of all radio stations not owned, controlled, or operated by the Government independently of action taken by or on behalf of the Government under the aforesaid Executive orders of April 6 and April 30, 1917, shall be subject to the provisions of the act to regulate radio communication approved August 13, 1912.

The enforcement of this order is hereby delegated to the Secretary of the Navy, who is authorized and directed to take appropriate action in the premises.

WOODROW WILSON.

THE WHITE HOUSE,

13 February, 1920.

(No. 3228.)

The above order is printed in full for the information of all concerned.

LAND STATIONS REOPENED.

Attention is invited to the fact that the following coast stations are opened to public service for communication with vessels at sea:

Brooklyn, N. Y. (WCG). Jamaica, N. Y. (WSK). New Orleans, La. (WNU).
Burwood, La. (WBW). New London, Conn. (WLC). Newport, R. I. (WCI).

LOST COMMERCIAL RADIO OPERATORS' LICENSES.

Printed below is a list of radio operators' licenses which have been reported to this Bureau as having been lost. Should any of them be found, they should be returned to the Bureau for cancellation. Inspectors and others concerned should see that lost licenses are not being used by unauthorized persons.

Name.	Grade.	Number.	Date issued.	Port issued.
Anderson, D. J.	Second	14715	Oct. 21, 1919	New York.
Boyle, J. M.	First	17902	July 17, 1919	San Francisco.
Brown, Wm. A. R.	First	17686	May 4, 1918	New York.
Bryant, John D.	Second	12617	Jan. 13, 1920	New Orleans.
Conway, John B.	First	19037	Sept. 3, 1919	New York.
Crafts, Frederick M.	First	18315	Dec. 27, 1918	Do.
Davis, George T.	Second	12243	Aug. 20, 1919	New Orleans.
Flagg, John F.	First	12246	June 18, 1917	Baltimore.
Fraser, William S.	First	20118	Sept. 29, 1919	Seattle.
Gilman, Arthur B.	First	15422	Sept. 20, 1917	Do.
Godfrey, H. L.	First	15634	Sept. 28, 1917	Philadelphia.
Hart, Rexford E.	Second	14241	Aug. 6, 1919	New York.
Howard, W. N.	Second	15746	Dec. 9, 1919	Do.
Jackson, Alvin R.	First	18784	Aug. 28, 1919	Boston.
Jameson, J. B.	First	18922	Aug. 13, 1919	New York.
Jones, Chas. W.	First	19924	Jan. 9, 1920	Baltimore.
Kirchoff, Willard J.	First	18524	May 23, 1919	New York.
Le Compte, Herbert L.	First	16895	Feb. 17, 1919	Baltimore.
Lyon, Arthur M.	First	16712	Jan. 25, 1918	Detroit.
McClure, George N.	Second	14042	Nov. 6, 1918	New York.
McMahon, W. E.	First	16632	Apr. 19, 1917	Seattle.
Meldrum, Herbert J.	First	19626	Sept. 24, 1919	Boston.
Menz, George H.	Second	15759	Dec. 22, 1919	New York.
Mounger, Frank R.	First	20583	Dec. 29, 1919	Do.
Murphy, Roy H.	First	19630	Sept. 19, 1919	Baltimore.
Owen, Howard V.	Second	14274	Aug. 26, 1919	New York.
Peck, L. J.	First	20412	Nov. 6, 1919	Do.
Pettipas, William	First	16798	June 28, 1918	Boston.
Russell, E. P.	First	17995	Oct. 21, 1919	San Francisco.
Squires, J. E.	First	17836	May 26, 1919	Do.
Terleph, Joseph J.	First	17644	Apr. 11, 1918	New York.
Wilson, Willard S.	First	18172	June 13, 1919	Philadelphia.
Young, Harold D.	First	19099	Sept. 15, 1919	New York.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, April 1, 1920—No. 36

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of Aug. 15, 1919) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne Bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Butte, Mont.....	KMN	550, 1700	PR	X	Great Falls Power Co.
Great Falls, Mont. (Rainbow)	KTQ	550, 1700	PR	X	Do.
Metha Nelson ¹	KMP	250, 300, 525, 600	PR	X	Alaska Packers' Association.
Nakat Inlet, Alaska.....	KDW	300, 525, 600	PR	X	G. W. Hume & Co.
Thompson Falls, Mont.....	KLL	1700, 2000	PR	X	Thompson Falls Power Co.
		550, 1700			

¹ Permanently moored vessel in Bristol Bay, Alaska.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne Bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Angeles.....	KUJB	4	4	PG	X	U. S. Shipping Board..	R. C. of A.
Anthracite Bridge....	KUKG	4	4	PG	X	do.	
Aragon.....	KUKR			PG	X	The Aragon (Inc.)....	
Ario.....	KULM			PG	X	Standard Transportation Co.	
Arizapa.....	KULN	4	4	PG	X	U. S. Shipping Board..	Do.
Atlantic Sun.....	KUMS			PG	X	Sun Oil Co.	
Avalon.....	WPH			PG	X	William Wrigley, jr..	
Baddacock.....	KUJD	4	4	PG	X	U. S. Shipping Board..	
Bayport.....	KUJC	4	4	PG	X	do.	I. W. T. Co.
Blue Triangle.....	KUGS	4	4	PG	X	do.	
Chickamauga.....	KULC	4	4	PG	X	do.	
City of Joliet.....	KUJR	4	4	PG	X	do.	
Collingsworth.....	KUKX	4	4	PG	X	do.	R. C. of A.
Colthraps.....	KUMR	4	4	PG	X	do.	
Comerant.....	KUMQ	4	4	PG	X	do.	
Commack.....	KULT	4	4	PG	X	do.	
Conejos.....	KUKT	4	4	PG	X	do.	Do.
Conewago.....	KISB	4	4	PG	X	do.	
Conshohocken.....	KUGV	4	4	PG	X	do.	
Coot.....	KUJN			PG	X	East Coast Fisheries Co.	
Copan.....	KUMP			PG		Cuyamel Fruit Co.....	S. O. R. S.
Darien.....	KULG			PG		Panama R. R. Co.	
Donald McKay.....	KULL	4	4	PG	N	U. S. Shipping Board..	
Dunsyre.....	KUMF			PG		Robert Dollar Co.	
East Chicago.....	KUKD	4	4	PG	X	U. S. Shipping Board..	I. W. T. Co.
Eastern Belle.....	KUJT	4	4	PG	X	do.	
Eastern Crag.....	KUJV	4	4	PG	X	do.	
Eastern Merchant.....	KUKS	4	4	PG	X	do.	
Eastern Pilot.....	KULJ	4	4	PG	X	do.	I. W. T. Co.
Eastern Trader.....	KULK	4	4	PG	X	do.	
Ethan Allen.....	KUJQ	4	4	PG	X	do.	
Fishkill.....	KULF	4	4	PG	N	do.	
Fort Armstrong.....	KUKF	4	4	PG	X	do.	R. C. of A.
Freeport Sulphur No. 5.	KUMK			PG		Freeport Sulphur Transportation Co.	
Grebe.....	KUMJ			PG	X	East Coast Fisheries Co.	
Havilah.....	KUJK	4	4	PG	X	U. S. Shipping Board..	
Homer.....	KUMG			PG		Pacific Mail S. S. Co.	I. W. T. Co.
Hutchinson.....	KUJP	4	4	PG	X	U. S. Shipping Board..	R. C. of A.
John F. Penrose.....	KUKZ			PG		National Oil Co.	

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—continued.

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Jomar.....	KUGT	4	4	PG	X	U. S. Shipping Board..	R. C. of A. Do.
Kerhonkson.....	KUJF	4	4	PG	N	do.....	
Lake Galisteo.....	KUGL	4	4	PG	X	do.....	Owner of vessel.
Lake Ganado.....	KUMB	4	4	PG	X	do.....	
Lake Geysers.....	KULD	4	4	PG	X	do.....	
Lake Haresti.....	KUGN	4	4	PG	X	do.....	
Latham.....	KUKR	4	4	PG	.....	do.....	
Liberty Bell.....	KUJX	4	4	PG	X	do.....	
Louise.....	KUKN	.....	.....	PG	X	E. D. Burge.....	
Lyndonia.....	KULZ	.....	.....	PG	X	C. H. K. Curtis.....	
Maddequet.....	KUGZ	4	4	PG	X	U. S. Shipping Board..	
Mason City.....	KUGX	4	4	PG	X	do.....	
Mohinkis.....	KUKP	4	4	PG		do.....	S. O. R. S. I. W. T. Co.
Noddle Island.....	KUKK	4	4	PG	X	do.....	
Oklahoma City.....	KUML	4	4	PG	X	do.....	R. C. of A. Do.
Osprey.....	KUJN	.....	.....	PG	X	East Coast Fisheries Co.	
Otho.....	KULK	4	4	PG	.....	U. S. Shipping Board..	
Outagamie.....	KULS	4	4	PG	X	do.....	
Ozmo.....	KUJL	4	4	PG	.....	Northern Commercial Co.	
Pinellas.....	KULB	4	4	PG	X	U. S. Shipping Board..	
Pittsburgh Bridge.....	KUKL	4	4	PG	X	do.....	
Portola Plumas.....	KUMN	4	4	PG	.....	do.....	
Pylos.....	KULQ	4	4	PG	X	do.....	
Quabbin.....	KUJZ	4	4	PG	.....	do.....	
Ripon.....	KUGM	4	4	PG	X	do.....	R. C. of A.
San Juan.....	KULV	.....	.....	PG	.....	Libby, McNeil & Libby.	
Schuylkill.....	KUKC	4	4	PG	X	U. S. Shipping Board..	I. W. T. Co.
Selma.....	KUKQ	4	4	PG	.....	do.....	
Seminole.....	KUGP	4	4	PG		do.....	R. C. of A.
Sioux City.....	KUGK	4	4	PG	X	do.....	
Star of Holland.....	KUGQ	4	4	PG	X	Alaska Packers' Association.	R. C. of A.
Staten Island.....	KUMD	4	4	PG	X	U. S. Shipping Board..	
Summerleaf.....	KUGR	4	4	PG	X	do.....	S. O. R. S.
Tancarville.....	KUKM	.....	.....	PG	.....	Philippine Vegetable Oil Co.	
Thrasher.....	KUJG			PG	X	Olaf Swenson.....	R. C. of A.
Toopi.....	KULP	4	4	PG	X	U. S. Shipping Board..	
Utacarbon.....	KUMC	4	4	PG		do.....	Do.
Vallonia.....	KULR	4	4	PG	X	do.....	
West Calera.....	KUMM	4	4	PG	X	do.....	S. O. R. S.
West Hixton.....	KUKV	4	4	PG	X	do.....	
West Jappa.....	KUKJ	4	4	PG		do.....	I. W. T. Co.
Winston-Salem.....	KUJS	4	4	PG	.....	do.....	
Woudrichem.....	KGIU			PG		Universal Transportation Co.	Do.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDW	Nakat Inlet, Alaska.....c	KUKM	Tancerville.....b
KGIU	Woudrichem.....b	KUNN	Louise.....b
KISB	Conewago.....b	KUKP	Mohinkis.....b
KLL	Thompson Falls, Mont.....c	KUKQ	Selma.....b
KLQ	Great Falls, Mont. (Rainbow).....c	KUKR	Latham.....b
KMN	Butte, Mont.....c	KUKS	Eastern Merchant.....b
KMP	Mettha Nelson ¹.....c	KUKT	Conejos.....b
KUGK	Sioux City.....b	KUKV	West Hixton.....b
KUGL	Lake Galisteo.....b	KUKX	Collingsworth.....b
KUGM	Ripon.....b	KUKZ	John F. Penrose.....b
KUGN	Lake Haresti.....b	KULB	Pinellas.....b
KUGP	Seminole.....b	KULC	Chickamauga.....b
KUGQ	Star of Holland.....b	KULD	Lake Geyser.....b
KUGR	Summerleaf.....b	KULF	Fishkill.....b
KUGS	Blue Triangle.....b	KULG	Darien.....b
KUGT	Jomar.....b	KULJ	Eastern Pilot.....b
KUGV	Conshohocken.....b	KULK	Eastern Trader.....b
KUGX	Mason City.....b	KULL	Donald McKay.....b
KUGZ	Maddequet.....b	KULM	Ario.....b
KUJB	Angeles.....b	KULN	Arizpa.....b
KUJC	Bayport.....b	KULP	Toopi.....b
KUJD	Baddacock.....b	KULQ	Pylos.....b
KUJF	Kerhonkson.....b	KULR	Vallonia.....b
KUJG	Thrasher.....b	KULS	Outagamie.....b
KUJK	Havilah.....b	KULT	Commack.....b
KUJL	Ozmo.....b	KULV	San Juan.....b
KUJM	Coot.....b	KULX	Otho.....b
KUJN	Osprey.....b	KULZ	Lyndonia.....b
KUJP	Hutchinson.....b	KUMB	Lake Ganado.....b
KUJQ	Ethan Allen.....b	KUMC	Utacarbon.....b
KUJR	City of Joliet.....b	KUMD	Staten Island.....b
KUJS	Winston-Salem.....b	KUMF	Dunsyre.....b
KUJT	Eastern Belle.....b	KUMG	Homer.....b
KUJV	Eastern Crag.....b	KUMI	Grebe.....b
KUJX	Liberty Bell.....b	KUMK	Freeport Sulphur No. 5.....b
KUJZ	Quabbin.....b	KUML	Oklahoma City.....b
KUKB	Aragon.....b	KUMM	West Calera.....b
KUKC	Schuykill Bridge.....b	KUMN	Portola Plumas.....b
KUKD	East Chicago.....b	KUMP	Copan.....b
KUKF	Fort Armstroong.....b	KUMQ	Comerant.....b
KUKG	Anthracite Bridge.....b	KUMR	Colthraps.....b
KUKJ	West Jappa.....b	KUMS	Atlantic Sun.....b
KUKK	Noddle Island.....b	WFF	Avalon.....b
KUKL	Pittsburgh Bridge.....b		

¹ Permanently moored vessel in Bristol Bay, Alaska.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Grand Island, Mich.....	NBY	U. S. Navy.
Vladivostok, Russia.....	NPH	Do.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Cyan.....	NIFV	Osborne.....	NUQC
Harbor Tug No. 61.....	NUMX	Oveson.....	NIZD
Harbor Tug No. 74.....	NEKP	Pope.....	NUQB
Indiana.....	NHQ	Pruitt.....	NUPV
MacLeish.....	NUPT	Simpson.....	NUPX
McCormick.....	NUPZ	Torpedo Test Barge No. 1.....	NIFR
Mount Vernon.....	WUAA	Torpedo Test Barge No. 2.....	NIFS

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NHQ	Indiana.....b	NUMX	Harbor Tug No. 61.....b
NPH	Vladivostok, Russia.....c	NUPT	MacLeish.....b
NSY	Grand Island, Mich.....c	NUPV	Pruitt.....b
NEKP	Harbor Tug No. 74.....b	NUPX	Simpson.....b
NIFR	Torpedo Test Barge No. 1.....b	NUPZ	McCormick.....b
NIFS	Torpedo Test Barge No. 2.....b	NUQB	Pope.....b
NIFV	Cyan.....b	NUQC	Osborne.....b
NIZD	Oveson.....b	WUAA	Mount Vernon.....b

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, only.]

Station.	Call signal.	Station controlled by—
Baltimore, Md.....	3XG	Edward O. Hurlburt.
Buffalo, N. Y.....	8ZM	Cyrus H. Fraser.
College Station, Tex.....	5YF	Agricultural & Mechanical College of Texas.
Columbus, Ohio.....	8XI	Ohio State University.
Eugene, Oreg.....	7YB	University of Oregon.
Hanover, N. H.....	1YB	Dartmouth College.
House, Tex.....	5ZW	Donald H. Graham.
Houston, Tex.....	5ZV	Hallet E. Worthington.
Houston, Tex.....	5ZX	James L. Autry, jr.
Los Angeles, Calif.....	6XD	Western Radio Electric Co.
Minneapolis, Minn.....	9XI	University of Minnesota.
Mulga, Ala.....	5ZY	Thos. D. Sewell.
Muncie, Ind.....	9YR	Muncie Technical High School.
New York, N. Y.....	2XZ	Fordham University.
Philadelphia, Pa.....	3YC	North East High School.
Pittsburgh, Pa.....	8XH	Parker E. Wiggin.
Rochester, N. Y.....	8ZK	Alexander M. Lindsay, jr.
San Diego, Calif.....	6XZ	R. O. Shelton, M. D.
Savannah, Ga.....	3YB	Knights of Columbus.
Seattle, Wash.....	7YC	Young Men's Christian Association.
Seattle, Wash.....	7YD	Knights of Columbus.
Toledo, Ohio.....	8ZI	Adelbert J. Gogel.
Valley City, N. Dak.....	9ZX	Russell H. Pray.
Washington, D. C.....	3YA	Loomis Radio School.
Washington, D. C.....	3ZB	A. B. Brown.
Woodmere, N. Y.....	2XH	Cutting & Washington Radio Corporation.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1YB	First district: Hanover, N. H.	6XD	Sixth district: Los Angeles, Calif.
2XH	Second district: Woodmere, N. Y.	6XZ	San Diego, Calif.
2XZ	New York, N. Y.	7YB	Seventh district: Eugene, Oreg.
3XG	Third district: Baltimore, Md.	7YC	Seattle, Wash.
3YA	Washington, D. C.	7YD	Seattle, Wash.
3YB	Savannah, Ga.	8XH	Eighth district: Pittsburgh, Pa.
3YC	Philadelphia, Pa.	8XI	Columbus, Ohio.
3ZB	Washington, D. C.	8ZI	Toledo, Ohio.
5YF	Fifth district: College Station, Tex.	8ZK	Rochester, N. Y.
5ZV	Houston, Tex.	8ZM	Buffalo, N. Y.
5ZW	House, Tex.	9XI	Ninth district: Minneapolis, Minn.
5ZX	Houston, Tex.	9YR	Muncie, Ind.
5ZY	Mulga, Ala.	9ZX	Valley City, N. Dak.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name = Name of station.
 G. loc. = Geographical location: O=west longitude, N=north latitude, S=south latitude.
 Call = Call letters assigned.
 System = Radio system used and sparks per second.
 Range = Normal range in nautical miles.
 W. l. = Wave lengths assigned: Normal wave lengths in italics.
 Service = Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P =Private.
 O =Government business exclusively.
 Hours =Hours of operation:
 N =Continuous service.
 X =No regular hours.
 m =a. m. (12m=midday).
 s =p. m. (12s=midnight).
 Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
 I. W. T. Co.=Independent Wireless Telegraph Co.
 R. C. of A. =Radio Corporation of America.
 S. O. R. S. =Ship Owners Radio Service.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

BOLINAS, CALIF.—Rates, San Francisco to Hawaii 25 c. per word; night letter \$1 for first 13 words (which includes the necessary prefix); week-end letter rate \$1.50 for first 25 words (which includes the necessary prefix). San Francisco to Japan via Hawaii 80 c. per word day rate, 40 c. per word night rate.

BROOKLYN, N. Y.—Hours, N; rates, coastwise and transoceanic ships 6 c. per word; ships plying between ports within 200 miles of New York, N. Y., 3 c. per word.
 JAMAICA, N. Y.—*Read* Richmond Hill, Jamaica, N. Y.; rates, coastwise and transoceanic ships 6 c. per word.
 KAHUKU, HAWAII.—Rates, Hawaii to San Francisco 25 c. per word; Hawaii to Japan 64 c. per word day rate, 32 c. per word night rate.
 KVICHAK, ALASKA.—*Read* Kvichak, Alaska.
 LOCKANOK, ALASKA.—Operated and controlled by Libby, McNeil & Libby.
 MARION, MASS.—Rates, Marion, Mass., to Stavanger, Norway, 24 c. per word.
 NEW BRUNSWICK, N. J.—Rates, New York, N. Y., to Great Britain 17 c. per word.
 NEW LONDON, CONN.—Hours, N; rates, coastwise ships 6 c. per word, transoceanic ships 12 c. per word, ships plying between ports within 200 miles of New York, N. Y. 3 c. per word.
 NEW YORK, N. Y.—Service, PG; hours, X; rates, coastwise and transoceanic ships 6 c. per word; station operated and controlled by E. J. Simon.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

BOOBYALLA.—J. E. Chilberg owner of vessel.
 CLAUSEUS.—Station operated and controlled by R. C. of A.
 DAVENPORT.—J. O. Davenport owner of vessel.
 ERNY.—Name changed to Warszawa; Polish-American Navigation Corporation owner of vessel.
 FRANCIS L. SKINNER.—Oriental Navigation Co. owner of vessel.
 GARGOYLE.—Union Petroleum Steamship Co. owner of vessel.
 ICONIUM.—Hours, X; station operated and controlled by S. O. R. S.
 IDA.—Hours, X.
 J. L. LUCKENBACH.—Hours, X; rates, all services 4 c. per word.
 KERMANSHAH.—Kerr Navigation Corporation owner of vessel.
 KERMOOR.—Kerr Navigation Corporation owner of vessel.
 K. I. LUCKENBACH.—Edgar F. Luckenbach owner of vessel.
 OBACK.—*Read* Obak; station operated and controlled by S. O. R. S.
 ORIZABA.—New York and Cuba Mail S. S. Co. owner of vessel.
 RAINIER.—Station operated and controlled by owner of vessel.
 ROBIN ADAIR.—Robin Line Steamship Co. owner of vessel.
 SACHEM.—Pacific Mail Steamship Co. owner of vessel.
 SHERMAN.—Sherman Steamship Co. owner of vessel.
 SIERRA (KRW).—Station operated and controlled by owner of vessel.
 STEEL VOYAGER.—Station operated and controlled by Cutting and Washington Radio Corporation.
 STORM KING.—Rolph Navigation and Coal Co. owner of vessel.
 SUWANEE.—Name changed to Poznam; Polish-American Navigation Corporation owner of vessel.
 TRIUMPH.—Hours, X; station operated and controlled by I. W. T. Co.
 VITTORIE EMMANUELE III.—*Read* Vittorio Emmanuele III; station operated and controlled by R. C. of A.
 WATERBURY.—Name changed to Northern Star.
 WEST HARTS.—Hours, X; station operated and controlled by I. W. T. Co.
 WEST HIKAR.—*Read* West Hika; station operated and controlled by I. W. T. Co.
 WIDGEON.—Widgeon Co. owner of vessel.
 WM. HENRY WEBB.—Name changed to William H. Webb.
 XENIA.—Service, PG; hours, X; station operated and controlled by R. C. of A.

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED
AND CONTROLLED BY THE RADIO CORPORATION OF AMERICA
(FORMERLY MARCONI CO.):

Abron.	Cabrille.	Fairfield.
Absaroka.	Calispell.	Fasset.
Adway.	Calvert.	Fluor Spar.
Afalkey.	Cambridge (KIRR)	Folsom.
Afel.	Casper.	Fort Riley.
Afrania.	Castle Town.	Fort Scott.
Aiken.	Catawba.	Fort Seward.
Alanthas.	Cawker.	Fort Smith.
Alapaha.	Cedar Spring.	Fort Stevens.
Alderman.	Cerosco.	Fort Wayne.
Allies.	Chattanooga.	Fort Wright.
Alta.	Chautauqua.	Fourth Alabama.
Anthera.	Chebaulip.	Fresno.
Aowa.	Chimo.	
Appeles.	City of Sherman.	Garibaldi.
Archer.	Clairton.	Glen Ridge.
Argon.	Clarksburg.	Glorieta.
Armenia.	Clearwater.	Glymont.
Ascutney.	Cleopatra.	Glyndon.
Asotin.	Coconino.	
Asquam.	Cold Spring.	Hamlin.
Auburn.	Contoocook.	Haselhurst.
Aurora.	Coquina.	Hegira.
Awensdaw.	Corapeak.	Hickman.
	Coronado.	Hico.
Baladan.	Corsicana.	Hugoton.
Baldrige.	Corson.	Huguenot.
Ballcamp.	Council Bluffs.	Humrick.
Balliett.	Coup rle.	
Bannack.	Courtois.	Ida.
Barkhamstead.	Covalt.	Innoko.
Barrenfark.	Covedale.	Intan.
Barrington.	Covena.	Invincible.
Battahatchee.	Coverun.	Issaquena.
Baxley.	Cowan.	
Bay Head.	Coweta.	J. C. Donnell.
Bayou Teche.	Cowiche.	Jeanette Skinner.
Beaumont.	Crabtree.	
Belding.	Craincreek.	Kasota.
Bellbuckle.	Crawl Keys.	Kenosha.
Belloit.	Cushnoc.	Kineo.
Benzonia.		Kisnop.
Berea.	Daca.	Klamath.
Berela.	Dallas.	Kokomo.
Bessemer.	Dancey.	
Bethnor.	Davidson County.	Lackawanna Valley.
Blakeley.	Derbyline.	Lake Allen.
Blue Eagle.	Dertona.	Lake Alvada.
Bockonoff.	Dirigo.	Lake Arthur.
Bonnafon.	Dungeness.	Lake Aurice.
Boston Bridge.		Lake Beacon.
Bosworth.	East Cape.	Lake Belnona.
Bottineau.	Eastern King.	Lake Cathcoon.
Braddock.	Eastern Shore.	Lake Cayuga.
Brasher.	Eastern Star.	Lake Charlottesville.
Bromela.	Edgehill.	Lake Copley.
Brompton.	Edgemont.	Lake Crystal.
Broncho.	Edgemoor.	Lake Delancey.
Brookhaven.	Edgewood.	Lake Desha.
Bugaya.	Eelbeck.	Lake Dunmore.
Burnside.	Eldena.	Lake Ellsbury.
Burnwell.	Elkridge.	Lake Elmdale.
Cabeza.	Everglades.	Lake Ennis.

Lake Farabee.	Lake Winthrop.	Tunica.
Lake Farlin.	Lake Yelverton.	Tyee.
Lake Farragut.	Lightburne.	Umatilla.
Lake Festinia.	Lone Star.	Waco.
Lake Fighting.	Lorain.	Walden.
Lake Flovilla.	Lordship Manor.	Wallingford.
Lake Folcroft.		Wallkill.
Lake Fondulac.	Mahanna.	Wanzu.
Lake Fontanet.	Mahaska.	Wasagya.
Lake Forsby.	Mahnet.	Watauga.
Lake Fossil.	Maiden Creek.	Watertown.
Lake Fostoria.	Manoa.	Waxahachie.
Lake Foxboro.	Mariners Harbor.	Wayucan.
Lake Frampton.	Marshfield.	West Boro.
Lake Franconia.	Mercer.	West Carnifax.
Lake Frazee.	Meriden.	West Cawthon.
Lake Frecks.	Milwaukee Bridge.	West Cayote.
Lake Freed.	Moccasin.	West Celina.
Lake Freezeout.	Moosabee.	West Cheswald.
Lake Frenchton.	Musketo.	West Cohas.
Lake Fresco.		Western Chief.
Lake Frugality.	Naiwa.	Western Cross.
Lake Frumet.	Neuse.	Westerner.
Lake Furlough.	New Windsor.	Western Hope.
Lake Gadsden.		Western King.
Lake Gardner.	Octorara.	Western Maid.
Lake Gaspar.	Olen.	West Erral.
Lake Geneva.	Opelika.	Westfield.
Lake Gera.	Orani.	West Grama.
Lake Gilpen.	Osakis.	West Grove.
Lake Gilta.	Ossining.	West Hembrie.
Lake Grainger.	Otsego.	West Humhaw.
Lake Grama.	Overbrook.	West Imboden.
Lake Grampian.		West Inskip.
Lake Gratis.	Pascagoula.	West Islay.
Lake Gravett.	Pawnee.	West Isleta.
Lake Gravity.	Phoenix.	West Ison.
Lake Gretna.	Phoenix Bridge.	West Keene.
Lake Harney.	Polar Sea.	West Kyska.
Lake Hemlock.	Polar Star.	Westmead.
Lake Inaha.	Polias.	Westmount.
Lakeland.	Pontchartrain.	West Nosska.
Lake Lasang.	Python.	West Point.
Lake Lida.		Westpool.
Lake Linden.	Romulus.	Westport.
Lake Louise.	Sacandaga.	West Quechee.
Lake Marion.	Saguache.	West Raritans.
Lake Markham.	Sahale.	West Shore.
Lake Mary.	Salmon.	West Vaca.
Lake Maurepas.	Sangamon.	Wheatland Montana.
Lake Medford.	Sapinero.	Wheaton.
Lake Narka.	Satartia.	Wilhelm Jebsen.
Lake Ontario.	Schenectady.	Winona County.
Lake Orange.	Schodak.	W. L. Steed.
Lake Otisco.	Seekonk.	W. M. Irish.
Lake Pearl.	Sharon.	Woodmansie.
Lake Pepin.	Shaume.	Woonsocket.
Lake Pewaukee.	Shooters Island.	W. S. Rheem.
Lake Sanford.	Shortsville.	Wynooche.
Lake Sapor.	Silverbrook.	Wytheville.
Lake Sebago.	Snug Harbor.	
Lakeshore.	Somerset.	
Lake Stirling.	St. Augustine.	Yadkin.
Lake Sunapee.	St. Johns County.	Yawah.
Lakeview.	Strathnaver.	Yellowstone.
Lake Weir.		York Harbor.
Lake Wilson.	Tampa.	Yosemite.
Lake Winona.	Texarkana.	Yukon.
	Tulsa.	Yuma.

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED
AND CONTROLLED BY THE SHIP OWNERS RADIO SERVICE (INC.).

Abbeville.	Buckhannon.	Editor.
Aberdeen.	Buhisan.	Eldridge.
Accomac.	Bulana.	Elinor.
Acrema.	Butte.	Esopus.
Aculeo.	Butterfield.	
Agria.		Fame.
Aimwell.	Cabura.	Faraby.
Alabat.	Cadaretta.	Federal.
Alcis.	Canoga.	Flavel.
Alcona.	Canumset.	Forster.
Aledo.	Caponka.	Fort Russell.
Allentown.	Casmalia.	Fort Sill.
Allison.	Castle Wood.	Fort Snelling.
Alloway.	Ceralvo.	
Alvada.	Cerro Gardo.	Galesburg.
Andalusia.	Chamberino.	Glendola.
Andra.	Chamblee.	Gray Eagle.
Angelina.	Chestnut Hill.	Guilford.
Arambi.	Chetopa.	Guimba.
Arundel.	Chibiabos.	
Askawake.	Chicago Bridge.	Hagan.
Aspenhill.	City of Fairbury.	Hatchie.
Assinippi.	City of Spokane.	Haverhill.
Astoria.	Clemence C. Morse.	Heffron.
Avondale.	Cohasset.	Hillsborough County.
	Cold Harbor.	Hokah.
Baganito.	Coloma.	Holbrook.
Bagoso.	Columbine.	Homestead.
Baldhill.	Connersville.	Hoxbar.
Baldrock.	Coperas.	Humaconna.
Balino.	Corcoran.	
Ballenas.	Corrales.	Independence.
Ballew.	Corvallis.	Iris.
Banaran.	Costigan.	
Barabos.	Cotteral.	Jackson.
Barranca.	Cottonplant.	Jacona.
Barryton.	Cottonwood.	
Basaan.	Coulter.	Kamesit.
Bedminster.	Cowanshannock.	Kanakee.
Belfort.	Cowboy.	Kangi.
Belgrade.	Craigsmere.	Katonah.
Bellota.	Craycroft.	Katrina Luckenbach.
Bethlehem Bridge.	Cresap.	Kearny.
Biloxi.		Keota.
Black Arrow.	Dalgada.	Kewanee.
Bloomington.	Dardania.	K. I. Luckenbach.
Blythedale.	Darrah.	Kishacoquillas.
Bobring.	Davenport.	Kitegaun.
Boilston.	Decatur Bridge.	Knoxville.
Bologan.	Deer Lodge.	Kusdeca.
Bonham.	Delight.	
Bonifay.	Diablo.	Lake Agomak.
Bonneteere.	Dochet.	Lake Annette.
Bon Secour.	Doylestown.	Lake Blanchester.
Boone.	Duquesne.	Lake Bledsoe.
Boonsborough.		Lake Calistoga.
Boreta.	Eastern Chief.	Lake Callicoon.
Boulton.	Eastern Cross.	Lake Calvenia.
Bound Brook.	Eastern Queen.	Lake Canaveral.
Boxley.	East Indian.	Lake Candelaria.
Boykin.	Eclipse.	Lake Cannonsburg.
Brentwood.	Edenton.	Lake Catherine.
Brookdale.	Edgecombe.	Lake Charles.
Brookside.	Edisto.	Lake Chelan.

Lake Como.	Montgomery.	Wathena.
Lake Daraga.	Moritz.	Watowan.
Lake Deval.	Morristown.	Waubesa.
Lake Eckhart.	Moss Point.	Waukegan.
Lake Eliko.	Mount Evans.	Wenakee.
Lake Elizabeth.	Mulpua.	West Apaum.
Lake Elkwater.	Muscatine.	West Arrow.
Lake Elkwod.		West Ashawa.
Lake Ellenorah.	National Bridge.	West Brook.
Lake Fanbush.	Neeolah.	West Chatala.
Lake Farber.	Nesco.	West Cherow.
Lake Faresman.	Newburgh.	Westchester.
Lake Faribault.	Nipsic.	West Coast.
Lake Farmingdale.	Nobles.	West Cobalt.
Lake Flume.	Norma.	West Compo.
Lake Flushing.	North Pole.	West Corum.
Lake Flynus.	Nupolela.	West Durfee.
Lake Foxcraft.	Nyanza.	West Eagle.
Lake Fray.	Oglethorpe.	West Elcasco.
Lake Freeborn.	Okesa.	Western Ally.
Lake Friar.	Onkama.	Western Belle.
Lake Frohna.	Orion.	Western Comet.
Lake Gakona.	Osaquinsick.	Western Hero.
Lake Galera.	Osawatomie.	Western Knight.
Lake Gedney.	Oshkosh.	Western Light.
Lake Giltedge.	Ossa.	Western Ocean.
Lake Gitano.	Ossineke.	Western Plains.
Lake Glebe.	Ozaukee.	Western Queen.
Lake Gradan.	Panga.	Western Wave.
Lake Gravella.	Passaic Bridge.	West Galeta.
Lake Greenbrier.	Pawtucket.	West Gotomska.
Lake Greenwood.	Pequot.	West Harcuvar.
Lake Grogan.	Point Loma.	West Hargrove.
Lake Hewes.	Puget Sound.	West Harshaw.
Lake Indian.	Quaker City.	West Hartley.
Lake Janet.	Quemakoning.	West Haven.
Lake Kytile.	Quidnic.	West Helix.
Lake Larga.	Quinault.	West Henshaw.
Lake Ledan.	Quinneseco.	West Hepburn.
Lake Lesa.	Quittacas.	West Hobomac.
Lake Licoco.	Redlands.	West Hosokie.
Lake Lilicusun.	Sabotawan.	West Indian.
Lake Otsquago.	Sachem.	West Insip.
Lake Pachuta.	Saco.	Westlake.
Lake Pleasant.	Sag Harbor.	Westland.
Lake Singara.	Salvation Lass.	West Lashaway.
Lake Strabo.	Saris.	West Loquassuck.
Lake St. Regis.	Saugerties.	West Mahomet.
Lake Superior.	Schoharie.	West Munham.
Lake Tulare.	Seattle Spirit.	West Segovia.
Lake Washburn.	Seypen.	West View.
Lake Winooksi.	Stanley.	Westward Ho.
Lake Yahara.	Sturgeon Bay.	West Wauna.
Latoka.	Sutherland.	West Wind.
Lehigh.	Swampscott.	Westwood.
Liberty.	Tartar.	West Zucker.
	Tillamook.	William Henry Webb.
	Tipton.	Willimantic.
	Utoka.	Winyah.
	Wahkiakum.	Wishkah.
	Wallowa.	Woodmansie.
	Wasco.	Woyaca.
	Wassaic.	
Major Wheeler.		Yakima.
Makanda.		Yesoking.
Manada.		Youngstown.
Maratanza.		Yucca.
Masuda.		
Medford.		
M. J. Scanlon.		
Mojave.		
Monana.		
Mono.		

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND
CONTROLLED BY THE INDEPENDENT WIRELESS TELEGRAPH CO.

Ablanset.	Castle Point.	Evansville.
Absecon.	Challenger.	Eyota.
Agarista.	Chantier.	
Agawam.	Chaparel.	Falmouth.
Ahala.	Chappell.	Farnam.
Alector.	Charlot.	Finland.
Algonquin.	Cheron.	Fonduco.
Alpaco.	Chipchung.	Fort Leavenworth.
Ambridge.	City of Eureka.	Fort Pitt Bridge.
Anacortes.	Clare.	
Aniwa.	Clio.	Galahad.
Anniston.	Coamo.	Garfield.
Apache (KVA).	Coaxet.	Glendoyle.
Apalachee.	Cokato.	Gloucester.
Arado.	Cokesit.	Goodspeed.
Ardena.	Colindo.	Goree.
Artemis.	Colorado Springs.	Governor John Lind.
Artisan.	Comanche.	Gray Cloud.
Asabeth.	Congaree.	Grayling.
Ashbee.	Conotton.	Grecian.
	Consort.	Guardsman.
Baldbutte.	Copalgrove.	Guaro.
Balsan.	Cornucopia.	Gunston Hall.
Balsto.	Corozal.	
Banago.	Costilla.	Haddon.
Bancroft.	Cotati.	Harish.
Bar Harbor.	Coulee.	Hartford.
Barralton.	Courageous.	Hatteras.
Barstow.	Coushatta.	Henry Clay.
Bathalum.	Coutolene.	Houma.
Belair.	Cowee.	Howard.
Bellingham.	Craigrownie.	Hoxie.
Benoni.	Cranenest.	Hulver.
Berwyn.	Crathorne.	Huron.
Betsey Bell.	Cretan.	Hyannis.
Biran.	Cruso.	
Blair.	Custodian.	
Blandon.		Ice King.
Botsford.	Dade County.	Indianapolis.
Boxbutte.	Datis.	Ingold.
Boynton.	Defiance.	Iroquois.
Brandywine.	Delavan.	Isabela.
Braxton.	Deranof.	Isanti.
Brazos.	Deva.	Isonomia.
Bremerton.	Devolente.	
Brookhaven.	Dio.	Jacox.
Buckhorn.	Dorchester.	Jefferson County
Bushong.		Jekyl.
Buttercup.		Johnson City.
	Easterling.	Juniata (KQJ).
Cabegon.	Easterner.	
Caddopeak.	Eastern Light.	Keketticut.
Calala.	Eastern Mariner.	Kershaw.
Calaveras.	Eastern Moon.	Kirkapoo.
Calicorock.	Eastern Sea.	Kimta.
Callabasas.	Eastern Star.	Knights Island.
Callooh.	Eastern Sun.	Kroonland.
Calno.	East Side.	
Canibas.	East Wind.	
Cape May.	Edgefield.	Laborer.
Capines.	Edmore.	La Forge.
Caribou.	Elkton.	Lake Akkra.
Cascade.	Elmsport.	Lake Arline.
Casco.	Englewood.	Lake Benbow.
	Essex.	Lake Benton.

Lake Berdan.	Lenape.	Plainfield.
Lake Bridge.	Lewiston.	Point Arena.
Lake Cahoon.	Liberty Land.	Polar Bear.
Lake Charlotte.	Lithopolis.	Polybius.
Lake Crescent.	Lonoke.	Ponce.
Lake Duncan.	Louisville Bridge.	Pontia.
Lake Dymmer.	Luxpalile.	Poughkeepsie.
Lake Ellendale.		Proctor.
Lake Fannin.	Magunkook.	Prusa.
Lake Farge.	Mangore.	
Lake Faristell.	Mannahocking.	Quapaw.
Lake Fernalda.	Margaret (KZO).	Quinnipiac.
Lake Fernwood.	Mariana.	Quistconck.
Lake Fibre.	Masca.	Quque.
Lake Fielding.	Mattapan.	
Lake Flagon.	McKeesport.	Remus.
Lake Fluvana.	Mercer Victory.	Riverside Bridge.
Lake Fonda.	Merrimack.	Roanoke.
Lake Fontana.	Merry Mount.	Ruth.
Lake Forkville.	Middlebury.	
Lake Forney.	Mineola.	Saccarappa.
Lake Fouche.	Minnequa.	Sac City.
Lake Fraichur.	Mohawk (KVM).	Sagadahoc.
Lake Fraley.	Moline.	Sagaporack.
Lake Freeland.	Monasses.	Saluda.
Lake Frio.	Monmouth.	Santurce.
Lake Frolono.	Montclair.	Sarcozie.
Lake Fugard.	Monticello.	Saucon.
Lake Furley.	Montoso.	Saugus.
Lake Gaither.	Moraine.	Scantic.
Lake Garza.	Morganza.	Schoodic.
Lake George.	Mount Shasta.	Sewickley.
Lake Gilboa.	Mount Vernon Bridge.	Shannock.
Lake Glencoe.		Shickshinny.
Lake Gorin.	Nameaug.	Silverado.
Lake Gormanian.	Namecki.	South Pole.
Lake Govan.	Nansemond.	Steadfast.
Lake Grafton.	Nantahala.	St. Paul.
Lake Grampus.	Nantasket.	
Lake Granby.	Nantucket.	Tanka.
Lake Grandon.	Nashotah.	The Lambs.
Lake Graphite.	Nedmac.	Toka.
Lake Grattan.	Nemassa.	Toledo Bridge.
Lake Harris.	Neponset.	Topa.
Lake Helen.	Neshaminy.	Tripp.
Lake Jessup.	New York (KSN)	Tuckahoe.
Lake Lemando.	North Bend.	Tuckanuck.
Lake Licking.		
Lake Lillian.	Oakland.	Victorious.
Lake Mattato.	Oconee.	Vincennes Bridge.
Lake Monroe.	Ogontz.	Vincent.
Lake Ogden.	Okiya.	Volunteer.
Lake Ormoc.	Ontario.	
Lake Oseweya.	Opequan.	Wabash.
Lake Pickaway.	Oraton.	Wakan.
Lake Saba.	Osage.	Wakanna.
Lake Savus.	Oscoda.	Wakulla.
Lake Shawano.	Oskaloosa.	Wampum.
Lake Silver.	Oskawa.	Waneyanda.
Lake Traverse.	Ozette.	Warszawa.
Lakeville.		Wauconda.
Lake Wimico.	Panola.	Waukau.
Lake Yemassee.	Pasadena.	Waukesha.
Lake Ypsilanti.	Persian.	Wayhut.
Lake Zaliski.	Philadelphia (KSM).	West Alcoz.
Laurel.	Pipestone County.	West Aleta.
Lebanon.	Piqua.	West Alsek.

West Amargosa.	Western Pride.	Westmoreland.
West Avenal.	Western Scout.	West Nohno.
West Cactus.	Western Sea.	West Sequana.
West Caddoa.	Western Spirit.	West Tacook.
West Cajoot.	Western Star.	West Togus.
West Calumb.	Westford.	West Totant.
West Campgaw.	West Galoc.	West Wauneke.
West Cape.	West Gambo.	West Zeda.
West Carruth.	Westhampton.	West Zula.
West Cavanal.	West Hardaway.	Wihaha.
West Celeron.	West Harlan.	Woodman.
West Chetac.	West Hartland.	Worcester.
West Conob.	West Hematite.	
West Cressy.	West Irmo.	Yaklok.
West Ekonk.	West Kasson.	Yamhill.
West Elcajon.	West Lianga.	Yaquina.
West Eldara.	West Madaket.	
Western City.	West Maximus.	Zaca.
Western Glen.	West Modus.	Zirkel.

Strike out all particulars of the following-named vessels:

Amazonia.	Lake Huron.	Mayport.
Balabac.	Lakeside.	Natenna.
Brookfield.	Lassell.	Olockson.
Coral.	Maine (KXD).	St. Louis.
Despatch.	Manola.	Transfer No. 17.
Kaskaskia.	Marshall.	

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KBUI, *read* Vittorio Emanuele III; KELV, *read* Obak; KJC *read* Oconee; KOKC, *read* Northern Star; KOZK, *read* West Hiika; KOZV, *read* William H. Webb; WLM, *read* Warszawa; WLY, *read* Poznam; WSK, *read* Richmond Hill, Jamaica, N. Y.; and WZEO *read* Randolph S. Warner. Strike out all particulars following the call signals KBAE, KBIO, KEGD, KICL, KIMF, KMEA, KNOO, KOFB, KOO, KSL, KUCT, KXD, WNUU, WTIE, WZUO.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

BALTIMORE, MD.—Hours, 8 a. m. to 12 p. m.

NAVASSA ISLAND, CUBA.—*Read* Navassa Islands, W. I.

Strike out all particulars of the following-named stations:

ANASTASIA ISLE, FLA.

CAPE FEAR, N. C. (radio compass station).

NEW BRUNSWICK, N. J.

SAN FRANCISCO, CALIF. (Crocker Building), NWO.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

AUSBURNE.—*Read* Charles Ausburne.

BARNEGAT.—*Read* S. P. 1232 (Barnegat).

BREAKWATER.—*Read* S. P. 681 (Breakwater).

CHALLENGE.—*Read* S. P. 1015 (Challenge).

CONESTOGA.—*Read* S. P. 1128 (Conestoga).

EXPLORER.—*Read* NAVM.

FEARLESS.—*Read* S. P. 724 (Fearless).

FRANCIS B. HACKETT.—*Read* S. P. 1161 (Francis B. Hackett).

GENESEE.—*Read* S. P. 1116 (Genesee).
 ISABEL.—*Read* S. P. 521 (Isabel).
 MAY.—*Read* S. P. 164 (May).
 NOKOMIS.—*Read* S. P. 609 (Nokomis).
 SARATOGA.—*Read* NELB.
 SOTOYOMO.—*Read* NECZ.
 S. P. 237 (Ranger).—*Read* Ranger.
 UTOWANA.—*Read* S. P. 951 (Utownah).
 WAINWRIGHT.—*Read* NKX.
 WINCHESTER.—*Read* S. P. 156 (Winchester).

Strike out all particulars of the following-named stations:

Bainbridge.	Paul Jones.	Subchaser No. 321.
Barry.	Perry.	Subchaser No. 418.
C-5.	Rambler.	Troy.
Emeline.	S. P. 319. (J. A. Palmer.)	Truxtun.
Goliath.	Subchaser No. 4.	Wasp.
Guard.	Subchaser No. 137.	Winnisimmet.
Harvard.	Subchaser No. 256.	Wissahickon.
Hull.	Subchaser No. 261.	
P. A. H. Hubbard.	Subchaser No. 290.	

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NHF, *read* S. P. 521 (Isabel); NJI, *read* S. P. 951 (Utownah); NKC, *read* Navassa Island, W. I.; NKG, *read* S. P. 1116 (Genesee); NKX, *read* Wainwright; NTD, *read* S. P. 1161 (Francis B. Hackett); NADQ, *read* S. P. 1232 (Barnegat); NAGP, *read* S. P. 1128 (Conestoga); NALQ, *read* S. P. 164 (May); NAMM, *read* S. P. 609 (Nokomis); NAVM, *read* (Explorer); NECZ, *read* Sotoyomo; NELB, *read* Saratoga; NEKM, *read* S. P. 724 (Fearless); NEKS, *read* S. P. 1015 (Challenge); NUDG, *read* Ranger; NUKS, *read* S. P. 156 (Winchester); NUMS, *read* S. P. 681 (Breakwater), and NUPR, *read* Charles Ausburne. Strike out all particulars following the call signals, NAP, NDK, NDX, NFF, NHE, NIA, NIC, NMT, NNR, NOP, NOY, NSV, NUS, NVY, NWO, NXO, NACQ, NADJ, NAMP, NAVK, NELZ, NOBF, NOKK, NOQX, NORF, NOST, NOVD, NOZQ, and NUFX.

SPECIAL LAND STATIONS BY NAMES OF STATIONS.

Strike out all particulars of the following-named stations:

Cleveland, Ohio (8XF).
 Detroit, Mich. (8XD).

MISCELLANEOUS.

LAND STATIONS REOPENED.

Attention is invited to the fact that the following coast stations are open to general public service, at all hours, for communication with vessels at sea:

Brooklyn, N. Y. (WCG) Richmond Hill, Jamaica, N. Y. (WSK) New London, Conn. (WLC).

RATE CHANGES.

Beginning April 1, 1920, the rate for North and South American service and *transoceanic* service on all vessels operated and controlled by the Radio Corporation of America will be 4 cents per word.

On ship and coast stations operated and controlled by the International Radio Telegraph Co. there is no charge for relay traffic.

APPLICATIONS FOR RADIO CALL LETTERS.

Applications for radio call letters should be made to radio inspectors and collectors of customs at the different ports and not to the office of this Bureau in Washington. Applications should be made at the time application is made for the official number and signal letters and not before such time.

CHANGE IN STATION AT PUERTO OBALDIA, R. P.

Herewith is printed Circular No. 643-69 (corrected) received from the Executive Office, Panama Canal, Balboa Heights, C. Z.:

JANUARY 12, 1920.

Notice to Mariners.

U. S. Naval Radio Station, Puerto Obaldia, in Operation.

1. The U. S. Naval Radio Station, Puerto Obaldia, R. P., is now in operation. The station is located at Puerto Obaldia, near the eastern extremity of the Atlantic seacoast of the Republic of Panama; approximate position, latitude $8^{\circ} 40'$ north, longitude $77^{\circ} 22'$ west. The station call is NRK.

2. Puerto Obaldia is operated by the U. S. Naval Communication Service and is prepared to handle U. S. and Panamanian Government despatches free of charge. The station also handles commercial traffic at rates which may be obtained from the Naval Radio Station, Balboa, C. Z.

3. The following daily schedule of watches will be maintained by Puerto Obaldia Radio: 6.00 to 8.00 a. m.; 12.00 noon to 2.00 p. m.; 6.00 to 8.00 p. m. All messages for this station will be handled via Balboa Radio on above schedules, and those received at Balboa at any time outside of schedule can not be transmitted until the following schedule.

4. Messages for Puerto Obaldia, or other U. S. Naval Radio Stations in the Republic of Panama, may be filed at any of the Panama Railroad or Panama National Telegraph offices.

JAY J. MORROW,
Acting Governor.

LAND STATION LICENSES.

All commercial land stations, experimental, and technical and training stations are required to obtain a license before operating as required by section 1 of the act of August 13, 1912.

The filing of the application or the assignment of radio call letters does not constitute authority for operating a station.

Owners of stations who fail to apply with the above requirements may expect action to be taken in accordance with the above-cited act.

ADDITIONAL COPIES

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, May 1, 1920—No. 37

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of Aug. 15, 1919) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Boston, Mass. 1.....	WBF	300, 600	PG	N	Tropical Radio Telegraph Co.
New York, N.Y.	WHI	300, 600, 1700	PR	X 2	John Wanamaker.
Ogden, Utah.	KUPQ	200, 422	PR	X	Ogden-Portland Cement Co.
Philadelphia, Pa.	WHE	300, 600, 1700	PR	X 2	John Wanamaker.
Seattle, Wash. 2.....	KPE	300, 450, 525, 600	PG	N	City of Seattle, Harbor Department.
Wahiawa, Hawaii 1..	KHK	300, 550, 600	PG	N	Mutual Telephone Co.

¹ Rates, 12 cents per word for all classes of service; no minimum.

² Open from 9 a. m. to 5 p. m.

³ Rates, shipping traffic, free; private business, 6 cents per word.

⁴ Rates, ship service, 6 cents per word, no minimum; interisland service, 15 cents per word, no minimum; interisland night letter, 25 words, \$1; each additional word, 4 cents; relay charges, ship to islands of Hawaiian group other than Oahu, 4 cents per word; ship to ship, no charge.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Arceturus.....	KURD			PG		Nafra Co.....	
Artigas.....	KJRG	4	4	PG	X	U. S. Shipping Board..	
Capillo.....	KUPM	4	4	PG	X	do.....	
Cathwood.....	KURC	4	4	PG		do.....	I. W. T. Co.
Chappaqua.....	KURF	4	4	PG	N	do.....	
Chickasaw City.....	KUNZ			PG	N	U. S. Steel Products Co	
City of Vernon.....	KUN3	4	4	PG	X	U. S. Shipping Board..	
Conehatta.....	KUQQ	4	4	PG	X	do.....	
Conness Peak.....	KUPL	4	4	PG	X	do.....	
Crudoll.....	KUQD	4	4	PG		Pan-American Petro- leum & Transport Co.	R. C. of A.
Cubore.....	KUPP			PG	X	Ore S. S. Corporation..	
Darden.....	KUPK	4	4	PG	N	U. S. Shipping Board..	
Eastern Crown.....	KUNQ	4	4	PG		do.....	Do.
Eastern Dawn.....	KUQT	4	4	PG		do.....	Do.
Eastern Glade.....	KUND	4	4	PG		do.....	Do.
Eastern Ocean.....	KUNF	4	4	PG		do.....	S. O. R. S.
Eastern Planet.....	KUPD	4	4	PG		do.....	I. W. T. Co.
Eastern Victor.....	KUNR	4	4	PG		do.....	S. O. R. S.
Everett.....	KUQR			PG		Chas. R. McCormick & Co.	
Evergreen City.....	KUNJ	4	4	PG	X	U. S. Shipping Board..	
Fishers Island.....	KUPZ	4	4	PG	X	do.....	
Freeport Sulphur No. 6.	KUNP	4	4	PG		Freeport Sulphur Transportation Co.	R. C. of A.
Fueloil.....	KUQB	4	4	PG		Pan-American Petro- leum & Transport Co.	Do.
George B. MacKenzie.	KUNT	4	4	PG	X	American Bauxite Co.	Do.
Greenland.....	KUP3	4	4	PG	N	U. S. Shipping Board..	S. O. R. S.
Hahatonka.....	KUPF	4	4	PG	X	do.....	Do.
Hawarden.....	KUPX	4	4	PG		do.....	R. C. of A.
Hinckley.....	KURB	4	4	PG		do.....	
Italia.....	KUPB			PG	X	Submarine Boat Cor- poration.	
Jennie R. Morse.....	KUNN	4	4	PG		U. S. Shipping Board..	
J. F. Penrose.....	KUQN	4	4	PG	X	do.....	
Juvisny.....	KUQX			PG	N	Independent S. S. Co..	
Kehuku.....	KUPV	4	4	PG	N	U. S. Shipping Board..	
Lake Gunnl.....	KUNC	4	4	PG	X	do.....	
Lake Harminia.....	KUNB	4	4	PG		do.....	

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—continued.

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Lake Hector.....	KUMZ	4	4	PG	X	U. S. Shipping Board.	
Lake Flag.....	KUMX	4	4	PG	X	do.....	
Lake Galucus.....	KUMV	4	4	PG	X	do.....	
Las Vegas.....	KUQM	4	4	PG	X	do.....	
Margaret.....	KUQS			PG		Red Salmon Canning Co.	R. C. of A.
Martha Washington..	KUQF	4	4	PG	N	U. S. Shipping Board.	S. O. R. S.
Montfaucou.....	KUQZ			PG	X	Independent S. S. Co.	
Nanquitt.....	KUQV	4	4	PG	X	U. S. Shipping Board.	
Naugus.....	KUPS	4	4	PG		do.....	R. C. of A.
Neshobee.....	KUNK	4	4	PG	X	do.....	
Oronoke.....	KUNL	4	4	PG	X	do.....	
Padnsay.....	KUQG	4	4	PG		do.....	S. O. R. S.
Panoil.....	KUQC	4	4	PG		Pan-American Petroleum & Transport Co.	R. C. of A.
Patrick Henry.....	KUPM	4	4	PG	X	U. S. Shipping Board.	Do.
Penthis.....	KUPC			PG		Sugar Products Co.	
Pulaski.....	KUQL	4	4	PG		U. S. Shipping Board.	
Rochellie.....	KUNX			PG			
Sepulga.....	KURK	4	4	PG	N	U. S. Shipping Board.	
Solitaire.....	KUMT			PG	X	Texas S. S. Co.	
Unicoi.....	KUQP	4	4	PG	X	U. S. Shipping Board.	
Union Liberty.....	KUNG	4	4	PG	X	do.....	
Waterbury.....	KUPT	4	4	PG	X	do.....	
West Cahokia.....	KUPJ	4	4	PG		do.....	I. W. T. Co.
West Keats.....	KUQK	4	4	PG		do.....	S. O. R. S.
West Nivaria.....	KUQJ	4	4	PG		do.....	Do.
Wheeling Mold.....	KUMN	4	4	PG	X	do.....	
Winona.....	KUNV	4	4	PG	X	do.....	R. C. of A.
W. K. Bixby.....	KURJ	4	4	PG		American S. S. Co.	Do.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; c—land station.]

Call signal.	Name.	Call signal.	Name.
KHK	Wahiawa, Hawaii.....c	KUPB	Italla.....b
KPE	Seattle, Wash.....c	KUPC	Penthis.....b
		KUPD	Eastern Planet.....b
KUMT	Solitaire.....b	KUPF	Hahatonka.....b
KUMV	Lake Galucus.....b	KUPG	Greenland.....b
KUMX	Lake Flag.....b	KUPJ	West Cahokia.....b
KUMZ	Lake Hector.....b	KUPK	Darden.....b
		KUPL	Conness Peak.....b
KUNB	Lake Harminia.....b	KUPM	Patrick Henry.....b
KUNC	Lake Gunnl.....b	KUPN	Capillo.....b
KUND	Eastern Blade.....b	KUPP	Cubore.....b
KUNF	Eastern Ocean.....b	KUPQ	Ogden, Utah.....c
KUNG	Unicn Liberty.....b	KUTR	*
KUNJ	Evergreen City.....b	KUPS	Naugus.....b
KUNK	Neshobee.....b	KUPT	Waterbury.....b
KUNL	Oronoke.....b	KUPV	Kehuku.....b
KUNM	Wheeling Mold.....b	KUPX	Hawarden.....b
KUNN	Jennie R. Morse.....b	KUPZ	Fishers Island.....b
KUNP	Freeport Sulphur No. 6.....b		
KUNQ	Eastern Crown.....b	KUQB	Fueloil.....b
KUNR	Eastern Victor.....b	KUQC	Panoil.....b
KUNS	City of Vernon.....b	KUQD	Crudoil.....b
KUNT	George B. MacKenzie.....b	KUQF	Martha Washington.....b
KUNV	Winona.....b	KUQG	Padnsay.....b
KUNX	Rochellie.....b	KUQJ	West Nivaria.....b
KUNZ	Chickasaw City.....b	KUQK	West Keats.....b

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS—continued.

Call signal.	Name.	Call signal.	Name.
KUQL	Pulaski.....b	KURD	Arcturus.....b
KUQM	Las Vegas.....b	KURF	Chappaqua.....b
KUQN	J. F. Penrose.....b	KURG	Artigas.....b
KUQP	Unicod.....b	KURJ	W. K. Bixby.....b
KUQQ	Conehatta.....b	KURK	Sepulga.....b
KUQR	Everett.....b		
KUQS	Margaret.....b		
KUQT	Eastern Dawn.....b		
KUQV	Nanquitt.....b		
KUQX	Juvighy.....b		
KUQZ	Montfaucon.....b		
KURB	Hinckley.....b	WBF	Boston, Mass.....c
KURC	Cathwood.....b	WHE	Philadelphia, Pa.....c
		WHI	New York, N. Y.....c

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States, edition of June 15, 1919.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Peary.....	NUQD		

SPECIAL LAND STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, only.]

Station.	Call signal.	Station controlled by—
Ann Arbor, Mich.....	8XA	University of Michigan.
Auburn, N. Y.....	8YA	Colby's Telegraph School.
Baltimore, Md.....	3XD	Johns Hopkins University.
Battle Creek, Mich.....	8ZC	Bert E. Clough.
Blackwell, Okla.....	8ZZ	Harold Schonwald.
Boston, Mass.....	1YC	Eastern Radio Institute.
Boseman, Mont.....	7XB	Montana State College.
Boseman, Mont.....	7ZD	R. Earl Dawes.
Cambridge, Mass.....	1XJ	Harvard University.
Camp Dix, N. J.....	2YA	Knights of Columbus.
Chicago, Ill.....	9ZN	Ralph H. G. Mathews.
Cliffwood, N. J.....	2XF	Western Electric Co.
Clifton, N. J.....	2XM	Lester Spangenburg.
College Station, Tex.....	5XB	Agricultural & Mechanical College of Texas.
Denver, Colo.....	9ZD	Edward C. Stockman.
Dover, Ohio.....	8ZX	Harry S. Weber.
Eagle Pass, Tex.....	5ZN	Ed. Nettleton.
Elberon, N. J.....	2XJ	Western Electric Co.
Elk, Wyo.....	7ZE	Harold Prescott Sheard.
Green Harbor, Mass.....	1XD	Western Electric Co.
Independence, Mo.....	9ZH	Reorganized Church of Christ of Latter Day Saints.
Ithaca, N. Y.....	8XU	Cornell University.
Kingston, R. I.....	1YA	Rhode Island State College.
Lacey, Wash.....	7YS	St. Martin's College.
Little Rock, Ark.....	5YH	United States Signal Corps.
Lynn, Mass.....	1XL	General Electric Co.
Madison, Wis.....	9XM	University of Wisconsin.
Manhattan, Kans.....	9YV	Kansas State Agricultural College.
Manitowoc, Wis.....	9ZL	W. C. Bridges and H. J. Burhop.
New Haven, Conn.....	1ZC	A. C. Gilbert Co.
New Rochelle, N. Y.....	2ZK	George C. Cannon.
New York, N. Y.....	2YT	Marconi Institute.
New York, N. Y.....	2XB	Western Electric Co.
New York, N. Y.....	2XG	De Forest Radio Telephone & Telegraph Co.

**SPECIAL LAND STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS—
continued.**

Station.	Call signal.	Station controlled by—
New York, N. Y.	2XO	Walter G. Hudson.
Norfolk, Va.	3ZC	City of Norfolk, Department of Public Safety.
Nutley, N. J.	2ZH	Arthur A. Hebert.
Pittsburgh, Pa.	8XK	Frank Conrad.
Pittsburgh, Pa.	8YZ	Peabody High School.
Rockville Center, N. Y.	2ZL	J. Owen Smith.
Savannah, Ga.	4XB	Board of Public Education.
Schenectady, N. Y.	2XA	E. M. Kinney.
Seattle, Wash.	7XZ	University of Washington.
Shreveport, La.	5ZS	William E. Antony.
Springfield, Ill.	9ZS	Illinois Watch Co.
Springfield, Mass.	1ZK	Glenn C. Sabin.
State College, N. Mex.	5XD	New Mexico College.
State College, Pa.	8XE	Pennsylvania State College.
Valparaiso, Ind.	9XD	Dodge's Institute of Telegraphy.
Vancouver, Wash.	7ZB	John D. Hertz.
Washington, D. C.	3XH	Lester S. Barr.
Wayne, Nebr.	9YT	State Normal School.
Wheeling, W. Va.	8ZW	John C. Stroebel, Jr.
Wilkes-Barre, Pa.	8ZS	John H. Stenger, Jr.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XD	First district:	7XB	Seventh district:
1XJ	Green Harbor, Mass.	7XZ	Bozeman, Mont.
1XL	Cambridge, Mass.	7YS	Seattle, Wash.
1YA	Lynn, Mass.	7ZB	Lacey, Wash.
1YC	Kingston, R. I.	7ZD	Vancouver, Wash.
1ZC	Boston, Mass.	7ZE	Bozeman, Mont.
1ZK	New Haven, Conn.	8XA	Elk, Wyo.
2XA	Springfield, Mass.	8XE	Eighth district:
2XB	Schenectady, N. Y.	8XK	Ann Arbor, Mich.
2XF	New York, N. Y.	8XU	State College, Pa.
2XG	Cliffwood, N. J.	8YA	Pittsburgh, Pa.
2XJ	New York, N. Y.	8YZ	Ithaca, N. Y.
2XO	Elberon, N. J.	8ZC	Auburn, N. Y.
2YA	New York, N. Y.	8ZS	Pittsburgh, Pa.
2YT	Camp Dix, N. J.	8ZX	Battle Creek, Mich.
2ZH	New York, N. Y.	8ZW	Wilkes-Barre, Pa.
2ZK	Nutley, N. J.	9XD	Dover, Ohio.
2ZL	New Rochelle, N. Y.	9XM	Wheeling, W. Va.
2ZM	Rockville Center, N. Y.	9YT	Ninth district:
3XD	Clifton, N. J.	9YV	Valparaiso, Ind.
3XH	Third district:	9ZD	Madison, Wis.
3ZC	Baltimore, Md.	9ZH	Wayne, Nebr.
4XB	Washington, D. C.	9ZL	Manhattan, Kans.
5XB	Norfolk, Va.	9ZN	Denver, Colo.
5XD	Fourth district: Savannah, Ga.	9ZS	Independence, Mo.
5YH	Fifth district:		Manitowoc, Wis.
5ZN	College Station, Tex.		Chicago, Ill.
5ZS	State College, N. Mex.		Springfield, Ill.
5ZZ	Little Rock, Ark.		
	Eagle Pass, Tex.		
	Shreveport, La.		
	Blackwell, Okla.		

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name = Name of station.
G. loc. = Geographical location: O=west longitude, N=north latitude, S=south latitude.

- Call** = Call letters assigned.
System = Radio system used and sparks per second.
Range = Normal range in nautical miles.
W. L. = Wave lengths assigned: Normal wave lengths in italics.
Service = Nature of service maintained:
 PG = General public.
 PR = Limited public.
 P = Private.
 O = Government business exclusively.
Hours = Hours of operation:
 N = Continuous service.
 X = No regular hours.
 m = a. m. (12m = midday).
 s = p. m. (12s = midnight).
Rates = Ship or coast charges, in cents: c = cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
I. W. T. Co. = Independent Wireless Telegraph Co.
R. C. of A. = Radio Corporation of America.
S. O. R. S. = Ship Owners Radio Service.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

NEW LONDON, CONN.—Rates, transoceanic ships, 6 cents per word; no minimum.

NEWPORT, R. I.—Hours X (licensed to operate 23 hours daily); rates, coastwise and transoceanic ships 6 cents per word, no minimum; ships plying between ports within 200 miles of New York 3 cents per word, no minimum.

SALTCHUCK, ALASKA.—Station operated and controlled by Saltchuck Mining Co.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ANCON.—Panama Railroad Co. owner of vessel.

APPELES.—Name changed to Kermit.

ARAGON.—Rates, North and South American, and transoceanic service 4 cents per word; station operated and controlled by Cutting and Washington Radio Corporation.

CHAS. R. VAN HISE.—Name changed to A. E. R. Schneider.

CITY OF SHERMAN.—Pensacola Shipbuilding Co. owner of vessel.

COLUMBIA.—Station operated and controlled by owner of vessel.

COTOFAXI.—Cinchfield Navigation Co. owner of vessel; station operated and controlled by R. C. of A.

EASTERN STAR.—Standard S. S. Co. owner of vessel.

FRANCIS L. SKINNER.—Name changed to Oran.

GLORIETA.—Munisl S. S. Corporation owner of vessel.

GOVERNOR FORBES.—Name changed to Caldas.

HUACHUCA.—Name changed to Orinoco.

JOHN F. PENROSE.—Rates, North and South American, and transoceanic service 4 cents per word; station operated and controlled by Cutting and Washington Radio Corporation.

KARINA.—Service, P; hours, X; France & Canada S. S. Co. owner of vessel; station operated and controlled by owner of vessel.

KERESAN.—Kerr Navigation Corporation owner of vessel.

KERLEW.—Kerr Navigation Corporation owner of vessel.

K. I. LUCKENBACH.—Luckenbach S. S. Corporation owner of vessel.

PARAISO.—Station operated and controlled by owner of vessel.

SAN ANTONIO.—Station operated and controlled by owner of vessel.

SAN RAMON.—Rates, 8 cents per word for all services; station operated and controlled by Wireless Service Co.

SANTA TERESA.—Grace S. S. Co. owner of vessel.

STAR 1.—Station operated and controlled by owner of vessel.

SUSANNA II.—Correct name SUSANA II; station operated and controlled by owner of vessel.

TAMESI.—Sinclair Navigation Co. owner of vessel.

WEST CALERA.—Western Pipe & Steel Co. owner of vessel.

YUMA.—Tropical Fruit Co. owner of vessel.

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE INDEPENDENT WIRELESS TELEGRAPH CO.

Arizpa.	El Occidente.	Orient.
Clemence C. Morse.	Lake Fitch.	Plow City.
Coltraps.	Liberty Bell.	Quinneseco.
Commack.	Monroe.	Tashmoo.
Dellwood.	New England.	West Hixton.
Des Moines.		

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE RADIO CORPORATION OF AMERICA (FORMERLY MARCONI CO.).

Atlantic Sun.	Corone.	Sabine Sun.
Centaurus.	Eagle.	Sacramento.
Circinus.	Lake Butler.	Sinsinawa.
Conejos.	Rock Island.	

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE SHIP OWNERS RADIO SERVICE (INC.).

Ashland County.	Lake Fighting.	Utoka.
Cethana.	Lake Fillion.	Wallula.
Collingsworth.	Lake Galewood.	West Campgaw.
Comerant.	Moravia Bridge.	Winston-Salem.
Eastern Belle.	Oneonta.	Worcester.
Coolcha.		

Strike out all particulars of the following-named vessels:

Braddock.	Gut Heil.	Lakeport.
Brookhaven.	Lake Damita.	Lake Worth.
Copan.	Lake Duane.	Quoque.
Cubadist.	Lake Felicity.	Randolph S. Warner.
Euharlee.	Lake Forest.	Santino.
Fairfield.	Lake Licking.	Singleton Palmer.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KBEA, *read* Lake Weir; KEMG, *read* Susana II; KIMX, *read* Orinoco; KOQV, *read* Caldas; WFUI, *read* A. E. R. Schneider; WMV, *read* Kermit; WQK, *read* Oran; and WLO, *read* WSO. Strike out all particulars following the call signals: KBIE, KBII, KETG, KLIJ, KLOA, KNV, KPOE, KPV, KRY, KTAE, KUMP, KVUI, WOQ, WPUA, WRAO, WSAI, WSIU, and WZEO.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

BULL ISLAND, S. C. (radio compass), strike out all particulars.

SIMSADUS, LONDON, strike out all particulars.

GOVERNMENT SHIP STATION, ALPHABETICALLY BY NAME OF VESSEL.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

DURHAM, strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS. •

Strike out all particulars following the call signals: NEDD, NGO, and NZY.

SPECIAL LAND STATION, BY NAME OF STATION.

LEXINGTON, Ky.—9YB changed to 9YC.

MISCELLANEOUS.

APPLICATIONS FOR RADIO CALL LETTERS.

Applications for radio call letters for ships should be filed with the collectors of customs at the various ports at the time application is made for the official number and signal letters and *not* before such time. When the official number has already been assigned, the application should give the number, and, in case a vessel has had a former name, the name should be given. All particulars regarding the hours of service, class of service, rates, etc., should be reported without delay in order that the information can be published in the RADIO SERVICE BULLETIN. When it is very inconvenient to apply to the collector of customs, application may be made to the radio inspector.

LAND-STATION LICENSES.

All commercial land stations, experimental and technical and training stations are required to obtain a license before operating, as required by section 1 of the act of August 13, 1912. The filing of the application or the assignment of radio call letters does not constitute authority for operating a station. Owners of stations who fail to comply with the above requirements may expect action to be taken in accordance with the above-cited act.

AMENDMENTS.

The Radio Laws and Regulations of the United States, edition August 15, 1919, are hereby amended as follows:

Page 58, paragraph 86, amended April 15, 1920, to read:

When applications and forms have been properly submitted, *ship and amateur* stations may be operated in accordance with the laws and regulations governing the class of station for which application for license has been made, until such time as the application can be acted upon unless the applicant is otherwise instructed and provided temporary official call letters are assigned.

Page 63, paragraph 119, amended May 1, 1920, to read:

If the applicant qualifies, the radio inspector or examining officer will forward the papers to the Commissioner of Navigation, with his recommendation. If approved, the license will be properly indorsed by the Secretary of Commerce and delivered to the licensee through the recommending officer.

It will be noted that the following was eliminated from the above paragraph: "*A blank commercial license, with.*"

RATE CHANGES.

Effective May 1, 1920, the International Radio Telegraph Co. is authorized to charge 6 cents per word, no minimum, for transoceanic service, instead of 12 cents per word, minimum \$1.20, and to make no minimum charge for other classes of service. These rates to apply to their stations at New London, Conn., and Newport, R. I.

NORTH SEA MINE RADIO SERVICE.

Mine warnings to Mariners No. 338, British Admiralty, London published the following:

Alterations in the marking of the mine-free channels in the North Sea, and information regarding mines, are transmitted by the German naval radio station at Eorkum every four hours, at 8 a. m., noon, 4 p. m., etc. (central European time), with a wave length of 600 meters. All merchant vessels are advised, in the interests of safety to keep continuous radio watch while proceeding within the limits of the mined areas.

TIME SIGNALS BY RADIO.

The Director of Naval Communications advises that time signals are being transmitted by the United States naval radio stations as follows:

Station.	Call letters.	Wave lengths.	When sent.
		<i>Meters.</i>	
Annapolis, Md.....	N88	¹ 17,000	Daily at 11.55 a. m. to noon and 9.55 to 10 p. m., standard time, seventy-fifth meridian.
Balboa, Panama.....	NBA	¹ 7,000	Daily at 4.55 to 5 a. m. and 12.55 to 1 p. m., standard time, seventy-fifth meridian.
Cavite, P. I.....	NPO	¹ 5,000	Daily at 10.55 to 11 a. m. and 9.55 to 10 p. m., standard time, one hundred and twentieth meridian, east.
Colon, Panama.....	NAX	¹ 1,500	Daily at 4.55 to 5 a. m. and 12.55 to 1 p. m., standard time, seventy-fifth meridian.
Eureka, Calif.....	NPW	2,000	Daily at 11.55 a. m. to noon, standard time, one hundred and twentieth meridian, west.
Great Lakes, Ill.....	NAJ	1,512	Daily except Sundays and holidays at 10.55 to 11 a. m., standard time, ninetyeth meridian.
Key West, Fla.....	NAR	1,500	Daily at 11.55 a. m. to noon, standard time, seventy-fifth meridian.
New Orleans, La.....	NAT	1,000	Daily at 11.55 a. m. to noon, standard time, seventy-fifth meridian.
North Head, Wash.....	NPE	2,800	Daily at 11.55 a. m. to noon, standard time, one hundred and twentieth meridian, west.
Pearl Harbor, Hawaii.....	NPM	¹ 11,200	Daily at one hundred and eightieth meridian, mean noon.
Point Arguello, Calif.....	NPK	¹ 600	Daily except Sundays and holidays at 11.55 a. m. to noon, standard time, one hundred and twentieth meridian, west.
San Diego, Calif.....	NPL	¹ 9,800 ² 2,400	Daily except Sundays and holidays at 11.55 a. m. to noon, standard time, one hundred and twentieth meridian, west.
San Francisco, Calif.....	NPH	¹ 4,800 ² 2,400	Daily at 11.55 a. m. to noon, standard time, one hundred and twentieth meridian, west.
Washington, D. C.....	NAA	2,500	Daily at 11.55 a. m. to noon, and 9.55 to 10 p. m., standard time, seventy-fifth meridian.

¹ Arc.² Spark.

CHANGE OF TIME IN THE BRITISH ISLANDS.

From 2 a. m. (Greenwich mean time) on March 28, 1920, until further notice British summer time, which is one hour in advance of Greenwich mean time, will be kept in the British Islands.

The clock time of all visual time signals, with the exception of the time gun at Edinburgh Castle, which will be fired at noon (Greenwich mean time), corresponding to 1h. 00m. 00s., British summer time, will be one hour later than the time shown in the Admiralty List of Time Signals under the column "Standard Time," the Greenwich mean time of the time signals remaining the same as shown in Admiralty publications.

In the Admiralty tide tables full information is given as to the time used.

In all cases in which the time shown by the clock differs from that used in the tide tables the difference must be applied to the time of the tide as obtained from the tide tables.

NOTE.—Greenwich mean time should invariably be used, both in Great Britain and Ireland, in all tidal records kept for permanent reference.

It should be noted that the change in time also temporarily affects certain Admiralty sailing directions and charts, etc., as well as the tables showing the duration of "official night" embodied in the public traffic regulations for various defended ports.

USE OF 800 METER WAVE LENGTH.

The wave length of 800 meters, for radio compass work exclusively, must not be used for general public service messages. This is prohibited by the act of August 13, 1912, and the International Radiotelegraphic Convention.

EXAMINATIONS.

On and after this date radio inspectors will be governed by regulation 133 in the reexamination of applicants for radio operators' licenses, which requires applicants who fail to pass to wait three months before applying for another examination.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, June 1, 1920—No. 38

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of Aug. 15, 1919) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Babylon, N. Y. (see New York, N. Y.).	WSE				
New York, N. Y.¹.	WSE	300, 450, 600	PG	N	Independent Wireless Telegraph Co.
Tuckerton, N. J.	WGG	8000	PG	N	Radio Corporation of America.

¹ Rates, ship service, 6 cents per word.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Adria.....	KUSZ	4	4	PG	X	U. S. Shipping Board.	
Anna E. Morse.....	KUTD	4	4	PG	X	do.	
Aquarius.....	KUSN			PG		Nafra Co.	
Baccarat.....	KUSX			PG	X	Independent S. S. Co.	
Birmingham City.....	KUTT	4	4	PG		U. S. Steel Products Co.	R. C. of A.
Brookline.....	KURT	4	4	PG	N	U. S. Shipping Board.	S. O. R. S.
Canco.....	KUTP			P	X	American Can Co.	Owner of vessel.
Capital of Nebraska.....	KUSF	4	4	PG	X	U. S. Shipping Board.	
Christabel.....	KUTN			PG	X	Savannah Bar Pilots.	
City of Lordsburg.....	KUTK	4	4	PG	X	U. S. Shipping Board.	
City of Reno.....	KUSK	4	4	PG		do.	S. O. R. S.
Crown City.....	KUSP	4	4	PG	X	do.	
Delrosa.....	KUTG	4	4	PG		do.	
Eastern Admiral.....	KURM	4	4	PG		do.	I. W. T. Co.
Eastern Cloud.....	KUSQ	4	4	PG		do.	S. O. R. S.
Eastern Coast.....	KURX	4	4	PG		do.	Do.
Eastern Glen.....	KUVB	4	4	PG		do.	
Eastern Maid.....	KUTF	4	4	PG		do.	
E. G. Crosby ¹.....	KURS			PG	N	Chicago, Racine & Milwaukee S. S. Co.	R. C. of A.
Haxtum.....	KUTB	4	4	PG		U. S. Shipping Board.	
Henry Steers.....	KURR	4	4	PG	N	do.	S. O. R. S.
Huron.....	KUSD	4	4	PG		do.	
Iroquois.....	KUTQ	4	4	PG	X	Puget Sound Navigation Co.	R. C. of A.
John F. Hylan.....	KUSM			PG		City of New York Police Dept.	
John Gibbons.....	KURL	4	4	PG		do.	Do.
John P. Reiss ¹.....	KUTM			PG	X	North American S. S. Co.	
Lake Furnas.....	KUTV	4	4	PG	X	U. S. Shipping Board.	
Lakeland ¹.....	WDL			PG	X	Tri-State S. S. Co.	Do.
Manatee.....	KURN	4	4	PG		U. S. Shipping Board.	
Mattole.....	KUSV	4	4	PG	N	do.	
Medrie.....	KURQ			PG	X	East Coast Fisheries Co.	Owner of vessel.
Nanshon.....	KUTL	4	4	PG	X	U. S. Shipping Board.	
Nemaha.....	KUSR	4	4	PG		do.	
Occidental.....	KUSJ	4	4	PG	X	Texas S. S. Co.	
Ohonkara.....	KURV					Carl Tucker	
Pallas.....	KUTJ	4	4	PG		U. S. Shipping Board.	
Pioneer.....	KUSL					Mutual Packing Co.	
Richconcal.....	KUTX	4	4	PG		U. S. Shipping Board.	

¹ Rates, Great Lakes service, 2 cents per word.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—continued.

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Rochester.....	KUTZ			PG	X	Vacuum Oil Co.....	
Salsam.....	KURP	4	4	PG	X	U. S. Shipping Board.	
Springfield.....	KUR	4	4	PG	X	do.....	
Subotco.....	KURZ			PG	X	Submarine Boat Corp	
Suedco.....	KUSE			PG	X	do.....	
Sumelseco.....	KUSC			PG	X	do.....	
Theodore Roosevelt	WCT			PG			
Vacuum.....	KUTS	4	4	PG		Vacuum Oil Co.....	R. C. of A.
West Camak.....	KUST	4	4	PG		U. S. Shipping Board.	
West Mahwah.....	KUTC	4	4	PG		do.....	I. W. T. Co.
West Nomentum.....	KUSG	4	4	PG	X	do.....	
William A. Whitney..	KUSS			PG	X	Whitney Brothers Co.	R. C. of A.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KURM	Eastern Admiral..... b	KUSX	Baccarat..... b
KURN	Manatee..... b	KUSZ	Adria..... b
KURP	Salsam..... b	KUTB	Haxtum..... b
KURQ	Medrio..... b	KUTC	West Mahwah..... b
KURR	Henry Steers..... b	KUTD	Anna E. Morse..... b
KURS	E. G. Crosby..... b	KUTF	Eastern Mald..... b
KURT	Brookline..... b	KUTG	Delrosa..... b
KURV	Ohonkara..... b	KUTJ	Pallas..... b
KURX	Eastern Coast..... b	KUTK	City of Lordsburg..... b
KURZ	Subotco..... b	KUTL	Nanshon..... b
KUSB	Suedco..... b	KUTM	John P. Reiss..... b
KUSC	Sumelseco..... b	KUTN	Christabel..... b
KUSD	Huron..... b	KUTP	Canco..... b
KUSF	Capital of Nebraska..... b	KUTQ	Iroquois..... b
KUSG	West Nomentum..... b	KUTR	Springfield..... b
KUSJ	Occidental..... b	KUTS	Vacuum..... b
KUSK	City of Reno..... b	KUTT	Birmingham City..... b
KUSL	Pioneer..... b	KUTV	Lake Furnas..... b
KUSM	John F. Hylan..... b	KUTX	Richconcal..... b
KUSN	Aquarius..... b	KUTZ	Rochester..... b
KUSP	Crown City..... b	KUVB	Eastern Glen..... b
KUSQ	Eastern Cloud..... b	WCT	Theodore Roosevelt..... b
KUSR	Nemaha..... b	WDL	Lakeland..... b
KUSS	William A. Whitney..... b	WGG	New York, N. Y..... c
KUST	West Camak..... b	WSE	New York, N. Y. (Babylon)..... c
KUSV	Mattloe..... b		

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Aramis.....	NARP	Paducah.....	NOG
God.....	NUQF		

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NOG	Paducah.....b	NUQF	Goff.....b
NARP	Aramis.....b		

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name =Name of station.
 G. loc. =Geographical location: O=west longitude, N=north latitude, S=south latitude.
 Call =Call letters assigned.
 System =Radio system used and sparks per second.
 Range =Normal range in nautical miles.
 W. L. =Wave lengths assigned: Normal wave lengths in italics.
 Service =Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P =Private.
 O =Government business exclusively.
 Hours =Hours of operation:
 N =Continuous service.
 X =No regular hours.
 m =a. m. (12m=midday).
 s =p. m. (12s=midnight).
 Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
 I. W. T. Co.=Independent Wireless Telegraph Co.
 R. C. of A. =Radio Corporation of America.
 S. O. R. S. =Ship Owners Radio Service.
 Co. =Company.
 Corpn. =Corporation.
 & =And.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

Richmond Hill, Jamaica, N. Y., strike out all particulars.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ARCTURUS.—U. S. Shipping Board, owner of vessel.

BERLIN.—Station operated and controlled by owner of vessel.

BORETA.—Petroleum Transport Service Corpn., owner of vessel.

CAPE LOOKOUT.—Name changed to *Kosciuszko*; station operated and controlled by R. C. of A.

CAUTO.—Rates, 8 c. per word for all services; New York & Cuba Mail S. S. Co., owner of vessel; station operated and controlled by I. W. T. Co.
 CHARLES BRALEY.—Cuba Distilling Co., owner of vessel.
 CLAUSEUS.—Green Star S. S. Corp., owner of vessel.
 COLOMBIA.—Station operated and controlled by Federal Telegraph Co.
 DAKOTAN.—Station operated and controlled by owner of vessel.
 EL ALBA.—Station operated and controlled by owner of vessel.
 GARFIELD.—Grace S. S. Co., owner of vessel.
 HOMER.—D. J. Hanlon, owner of vessel.
 J. F. PENROSE.—National Oil Transport Co., owner of vessel.
 JOHN P. REISS.—Call letters changed to K U T M.
 LAKE HARNEY.—International Coal Transportation Corp., owner of vessel.
 LAKE JESSUP.—International Coal Transportation Corp., owner of vessel.
 LAKE OTISCO.—International Coal Transportation Corp., owner of vessel.
 LEVI G. BURGESS.—Station operated and controlled by owner of vessel.
 MINNESOTAN.—Station operated and controlled by owner of vessel.
 OONEE.—E. H. Greene & Co., owner of vessel.
 PANUCCO (KWM).—Rates, 8 c. per word for all services; New York & Cuba Mail S. S. Co., owner of vessel; station operated and controlled by I. W. T. Co.
 PLEIADES.—Luckenbach S. S. Co., owner of vessel.
 SACHEM.—Name changed to *Cuba*.
 SANTA ELISA.—Grace S. S. Co., owner of vessel.
 SOL NAVIS.—Name changed to *Harry Luckenbach*; Luckenbach S. S. Co., owner of vessel.
 STANWOOD.—W. R. Chamberlin, owner of vessel.
 STRATHNAVER.—Name changed to *American Star*.
 THRASHER.—Name changed to *Kamchatka*; C. L. Hibbard, owner of vessel.
 WACOUTA.—Rates, 8 c. per word for all services; New York & Cuba Mail S. S. Co., owner of vessel.
 WEST CALERA.—U. S. Shipping Board, owner of vessel.
 WEST CATANACE.—Elder Steel S. S. Co., owner of vessel.
 WISCONSIN BRIDGE.—Name changed to *Sophie Frankel*.

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE RADIO CORPORATION OF AMERICA.

Ario.	Keresaspa.	S. B. Hunt.
Ashburn.	Kerkenna.	Seminole.
Basford.	Kermanshah.	Sewalls Point.
Caldas.	Kermoor.	Socony 89.
Canibaa.	Lancaster.	Socony 90.
City of Puebla.	Lydia.	Steel Age.
Clincho.	Mangore.	Steelmaker.
Communipaw.	Mexoil.	Sunbeam.
Conehatta.	Mineola.	Sunoil.
Corvus.	Nawitka.	Sunshine.
Cowardin.	New Britain.	Tancarville.
Coyote.	Northern Star.	Thala.
Cubore.	North Pines.	Trontolite.
Favorite (WCF).	Oran.	Vigo.
Fire Island.	Orient.	Vinita.
Fred W. Weller.	Orleans.	Warszawa.
Geo. H. Jones.	Pere Marquette 8.	West Cavanal.
Glendola.	Rajah.	West Irmo.
Gold Shell.	Red Cloud.	Westoil.
Herbert L. Pratt.	Richmond Boro.	William N. Page.
Herman Winter.	Roman.	Willpolo.
Horado.	Sagadahoc.	Winding Gulf.
Itompa.	Santa Tecla.	Wiala.
J. E. O'Neil.	Santa Teresa.	W. M. Burton.
Keresan.	Saxon.	

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED
AND CONTROLLED BY THE SHIP OWNERS RADIO SERVICE (INC.).

Alabama (WRAE).	Essex.	Kuwa.
Armenia.	Evelyn.	Lightburne.
Artigas.	Evergreen City.	Mazama.
Buckhannon.	G. A. Flagg.	Meriden.
Carolyn.	Hatteras.	Mystic.
City of Everett.	Hilton.	Rayo.
Conness Peak.	Holyoke Bridge.	Salinas.
Director.	Jean.	Solitaire.
Dirigo.	Jeannette Skinner.	Unicoi.
E. A. Morse.	Jennie R. Morse.	Zarembo.

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND
CONTROLLED BY THE INDEPENDENT WIRELESS TELEGRAPH CO.

Cartona.	Hinckley.	Virginia Bridge.
Darden.	Lake Flatonia.	Western Front.
East Chicago.	Latham.	
Fort Armstrong.	Merry Mount.	

EFFECTIVE JUNE 1, 1920, THE RATE FOR ALL CLASSES OF SERVICE OF
THE FOLLOWING-NAMED VESSELS IS 8 CENTS PER WORD.

Agwidale.	Corozal.	Monterey.
Alamo.	Esperanza.	Montoso.
Algonquin.	Guantanamo.	Morro Castle.
Antilla.	Henry R. Mallory.	Nueces.
Apache (KVA).	Huron.	Ponce.
Arapahoe.	Iroquois.	Rio Grande.
Brazos.	Isabela.	Sabine.
Camaguey.	Lampasas.	San Jacinto.
Cherokee.	Lenape.	San Juan (KGJ).
Coamo.	Matanzas.	San Marcos.
Comal.	Medina.	Santiago.
Comanche.	Mexico.	Santurce.
Concho.	Mohawk.	

Strike out all particulars of the following-named vessels:

Esperanca.	Lake Calvenia.	Long Island.
Gray Cloud.	Lake Champlain.	Piqua.
John F. Penrose (KUKZ).	Lake Grafton.	Polias.
Kenwood Bridge.	Lake Michigan.	Rock Island.
Knights Island.	Lake Stobi.	William O'Brien.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL
SIGNALS.

KIBM, *read* Sophie Frankel; KIGS, *read* Harry Luchenbach; KIPP, *read* American Star; KUJG, *read* Kamchatka; KZUE, *read* Kosciuszko; WNY, *read* New York, N. Y.; and WQU, *read* Cuba. Strike out all particulars following the call signals, KBIU, KBOA, KEZV, KIND, KISZ, KIVL, KMEE, KODM, KOGG, KUFV, KUKZ, KPN, WIO, WSK, WTUA, and WXOU.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF
STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

East San Pedro, Calif.—*Read* San Pedro, Calif.
Fishermans Island, Va.—Strike out all particulars.
Hillcrest, Calif.—*Read* NPG.
San Francisco Beach, Calif.—*Read* NPG.
Tuckerton, N. J.—Strike out all particulars.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

Strike out all particulars of the following-named vessels:

Nahant.	S. C. 207.	S. C. 407.
S. C. 1.	S. C. 292.	S. C. 434.
S. C. 90.	S. C. 293.	S. C. 436.
S. C. 99.	S. C. 300.	Sialia (NNV).

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NPG, *read* San Francisco Beach, Calif., and Hillcrest, Calif.. NPX, *read* San Pedro, Calif. Strike out all particulars following the call signals, NBF, NQE, NNV, NWW, NIQN, NIQQ, NOBB, NOFS, NOGG, NONK, NOSX, NOSZ, NOTK, NOZB.

SPECIAL LAND STATIONS BY NAMES OF STATIONS.

Waco, Tex. (5ZJ).—Strike out all particulars.

MISCELLANEOUS.

RATE CHANGE.

Effective June 1, 1920, the vessels owned by the Clyde S. S. Co., Mallory S. S. Co., New York & Cuba Mail S. S. Co., and the New York & Porto Rico S. S. Co., the stations of which are operated and controlled by the Independent Wireless Telegraph Co., are authorized to charge 8 cents per word for all classes of service. The old rate was 4 cents per word for North and South American service and 8 cents per word for transoceanic service. The names of these vessels are shown in this publication under "Alterations and Corrections."

LAND STATION CLOSED.

The Richmond Hill (Jamaica), N. Y., station of E. J. Simon has been closed.

TRANSMITTING TEST IN EXAMINATIONS.

Beginning June 1, this year, in addition to the receiving test given in the examination for radio operator a test in transmitting will be given at the same rate of speed as required now for receiving. An applicant is required to transmit correctly 100 consecutive characters for the commercial first-grade license, 60 consecutive characters for the commercial second grade, and 50 consecutive characters for the amateur first grade.

KEY OF RADIO ROOM ON BOARD AT ALL TIMES.

The Bureau's attention has been called to the fact that operators are neglecting to leave on board the key to the radio room in charge of the proper officer, when a vessel is in port as required by Regulation 17. It is suggested that a duplicate key be obtained for the radio room so that one may be on board at all times. Failure to comply with the regulation may result in action being taken by the

department against the operator, in view of the fact that the radio inspector can not inspect the apparatus unless he can enter the radio room.

CHANGE IN RADIO INSPECTION DISTRICTS.

The headquarters of the eighth district has been transferred from Cleveland, Ohio, to Detroit, Mich. The office of the inspector is in the Federal Building.

The office of the fourth district at Savannah, Ga., has been closed. The work of this district is being handled by the inspector of the third district, Customhouse, Baltimore, Md.

BROADCASTING HYDROGRAPHIC AND WEATHER REPORTS.

Hydrographic and weather reports are broadcasted (this service begun May 1, 1920) from the United States naval radio stations on the Pacific coast of the United States on the following schedules and wave lengths:

Radio station.	Time.	Wave lengths.
		<i>Meters.</i>
Point Arguello, Calif.....	8 a. m.....	952
	Noon.....	600
	4 p. m.....	952
	10 p. m.....	600
San Diego, Calif.....	8 a. m.....	600
	Noon.....	952
San Francisco, Calif.....	4 p. m.....	600
	10 p. m.....	952

UNITED STATES RADIO COMPASS STATIONS.

The following United States naval shore radio compass stations are now in operation for the purpose of furnishing bearings in the western Atlantic. For the present there will be no charge for bearings furnished.

Radio compass station.	Radio call.	Position.	
Bar Harbor, Me.....	NBD	Lat. 44° 18' 36" N.....	Lon. 68° 11' 27" W.
Gloucester, Mass.....	NAD	Lat. 42° 35' 19" N.....	Lon. 70° 41' 08" W.
Deer Island, Mass.....	NAD	Lat. 42° 21' 15" N.....	Lon. 70° 57' 30" W.
Fourth Cliff, Mass.....	NAD	Lat. 42° 09' 40" N.....	Lon. 70° 42' 22" W.
Cape Cod, Mass.....	NAE	Lat. 42° 02' 58" N.....	Lon. 70° 04' 32" W.
Surfside, Nantucket, Mass.....	NBS	Lat. 41° 14' 42" N.....	Lon. 70° 05' 59" W.
Price's Neck, R. I.....	NAF	Lat. 41° 27' 06" N.....	Lon. 71° 20' 15" W.
Watch Hill, R. I.....	NAF	Lat. 41° 18' 21" N.....	Lon. 71° 51' 29" W.
Montauk, L. I.....	NAH	Lat. 41° 03' 09" N.....	Lon. 71° 57' 27" W.
Fire Island, N. Y.....	NAH	Lat. 40° 38' 07" N.....	Lon. 73° 12' 32" W.
Rockaway Beach, N. Y.....	NAH	Lat. 40° 33' 52" N.....	Lon. 73° 52' 40" W.
Sandy Hook, N. J.....	NAH	Lat. 40° 28' 12" N.....	Lon. 74° 01' 06" W.
Mantoloking, N. J.....	NAH	Lat. 40° 01' 30" N.....	Lon. 74° 03' 10" W.
Cape May, N. J.....	NSD	Lat. 38° 55' 41" N.....	Lon. 74° 53' 10" W.
Cape Henlopen, Del.....	NSD	Lat. 38° 47' 33" N.....	Lon. 75° 05' 27" W.
Bethany Beach, Del.....	NSD	Lat. 38° 32' 45" N.....	Lon. 75° 03' 21" W.
Hog Island, Va.....	NCZ	Lat. 37° 22' 36" N.....	Lon. 75° 42' 37" W.
Cape Henry, Va.....	NCZ	Lat. 36° 55' 16" N.....	Lon. 75° 59' 51" W.
Cape Hatteras, N. C.....	NDW	Lat. 35° 14' 22" N.....	Lon. 75° 31' 42" W.
Cape Lookout, N. C.....	NAN	Lat. 34° 36' 13" N.....	Lon. 76° 32' 15" W.
North Island, S. C.....	NZW	Lat. 33° 13' 21" N.....	Lon. 79° 11' 06" W.
Morris Island, S. C.....	NAO	Lat. 32° 41' 36" N.....	Lon. 79° 53' 17" W.

NOTE.—The following radio compass stations are temporarily out of commission: Bar Harbor, Me.; Fourth Cliff, Mass.; Cape Cod, Mass.; Price's Neck, R. I.; Watch Hill, R. I.; Rockaway Beach, N. Y.; and Cape Henlopen, Del.

Where two or more of the foregoing compass stations have the same radio call it indicates that they are connected by wire telegraph to and under the control of a central control station, the radio call being the call of the central control station. When a request for bearings is made the central control station invariably answers with a bearing from each of the compass stations under its control.

The following signals have been authorized and will be used until further notice:

SIGNAL.	MEANING.
QTE ?	What is my true bearing ?
QTE	Your true bearing is degrees from Radio Compass Station.

To obtain bearings the compass station should be called in the usual manner, using the 800 meter wave length, the call to be followed by the signal "QTE ?," meaning "What is my true bearing ?" When told by the compass station to "K" (go ahead) the ship's radio operator should follow the procedure outlined below:

- (a) Transmit the ship's radio call for 30 seconds.
- (b) Make dashes, each dash 5 seconds long, for 1 minute, with the ship's radio call after each dash.
- (c) Terminate with the signal "K" (go ahead).

If satisfactory bearings are obtained the operator at the compass station will call the vessel in the usual manner and reply "QTE," followed by the true bearing in degrees (0 to 359) spelled out in words, and the name of the radio compass station from which the bearing was obtained; otherwise a repetition of the test will be requested.

The ship's operator should acknowledge receipt of the bearings by answering the compass station in the usual manner and repeat, in numerals, the bearings received. This procedure enables all stations concerned to check the bearings.

All U. S. naval shore radio compass stations keep watch and transmit on 800 meters for merchant vessels, and this wave length must be used for calling and answering and carrying on all communication with these stations.

Attention is invited to the fact that when a single bearing is furnished there is a possibility of an error of 180° , as the operator at the compass station can not always determine on which side of his station the vessel lies; in such cases the decision is left to the commander of the vessel.

Subject to the foregoing, bearings should be accurate within 2° of an arc. When bearings from three or more compass stations are not over 2° of arc in error, but do not meet at a fixed point, the geometrical center of the triangle formed by the bearings can generally be taken as the approximate position of the vessel.

The primary object of these stations is to assist in the navigation of vessels during atmosphere of low visibility.

In order that the operation of shore radio compass stations may be checked up, it is requested that a brief report be forwarded to the Director Naval Communications, Navy Department, Washington, D. C., containing the following particulars:

1. Name of ship.
2. Name of radio compass station.

3. Date and G. M. T. at which radio bearing was taken.
4. Bearing given by radio compass station.
5. Estimated position of ship at above time and dates by methods other than radio.
6. The probable degree of accuracy of the estimated position.
7. Weather conditions at above time.
8. Remarks, if any.
9. Signature of master or responsible navigating officer.

ACCURACY OF RADIO BEARINGS.

The following information was furnished by the Director of the U. S. Naval Communication Service under date of October 10, 1919:

"The reliance that can be placed in bearings furnished by shore radio compass stations will be governed by the following conditions:

- "(a) When two sets of bearings are received which do not agree, a third set should immediately be requested.
- "(b) In thick weather bearings should be requested at least every half hour.
- "(c) Bearings that pass over intervening land or that are tangent to the shore line are not as reliable as those that have a clear sweep over the sea.
- "(d) Navigators receiving a set of bearings should immediately investigate the approximate fix indicated and determine whether or not they are being furnished with bearings from the stations that should be most reliable.
- "(e) When the position of the ship as indicated by the radio bearing differs materially from the position by dead reckoning, a second set of radio bearings should be requested in order to check the first radio position."

The following notice received from London under date of March 17, 1920, is published for the information of radio operators and masters of vessels.

ADMIRALTY NOTICE TO MARINERS.

[No. 478 of the year 1920.]

WIRELESS METEOROLOGICAL INFORMATION TO AND FROM SHIPS AT SEA.

General remarks.

Former Notice.—No. 8 of 1920; hereby canceled.

1. It is earnestly hoped that all concerned will assist in making the wireless meteorological service a success. Negotiations are now in hand to extend and unify the system of collecting weather data by wireless from ships at sea all over the world, and at the same time to organize the free transmission of weather bulletins from a sufficient number of wireless stations to admit of ships being constantly supplied with reliable weather reports and forecasts wherever they may be.

2. It should be borne in mind that the needs of ships at sea in regard to information regarding the weather will march hand in hand with the requirements of aircraft. The importance of this service will therefore be constantly increasing, and its success or failure will largely depend upon the cooperation of ships at sea in providing the data without which accurate forecasting is impossible. The matter does not depend solely upon the efforts of the ships selected to furnish the data. The essence of success lies in rapidity in passing such data by wireless from the ship to the coast station, and thence to the central meteorological office. It follows, therefore, that all ships not taking an active part in supplying data should use the greatest care not to interfere with the transmission of the wireless messages to the shore.

3. The following particulars refer to the scheme now being undertaken by the British Meteorological Office. This notice will, however, be subject to revision from time to time, and endeavors will be made to include in each revision all information available to date of the weather bulletins issued by the wireless stations of the world. Earnest endeavors are being made to obtain international agreement as to the form of these weather bulletins and to the methods and times of transmissions. It is hoped that the messages will eventually all be made in an international code at fixed times, so arranged that a ship with only one wireless operator will be able to read them. A similar scheme for time signals is being evolved.

Collection of weather data from ships.

4. Certain ships are being asked to supply data regularly three times a day _____ and in addition to the regular observations, which are taken at 0100, 0700, and 1300 Greenwich time and sent as soon as possible to Malin head (GMH) or Valentia (GCK) coast stations, these ships may, on request from either of these coast stations, send special data messages at other times.

5. Precise instructions as to the procedure for ships which intend to send a data message, together with the necessary code, will be issued at an early date.

Issue of weather bulletins to ships.

6. A wireless weather bulletin may contain both or either of the following:

(a) A weather report, which is an official statement of existing weather conditions; and/or

(b) A weather forecast, which is an official opinion of probable future weather conditions.

7. The accompanying schedule of wireless weather bulletins is intended to provide, in a form suitable to give all information required by the wireless operator, a complete and up-to-date list of all weather bulletins transmitted at fixed times by wireless stations throughout the world. The same information will be found in detail in the Sailing Directions and in the International List of Radiotelegraph Stations (the Berne List).

8. The times given in the third column of the schedule are expressed in the 4-figure notation employed for signaling during the war. The term "G. M. T." here means the civil mean time of the meridian of Greenwich, with the day commencing at mid-night and the hours reckoned from 00 to 23.

9. Operators are reminded that article 45 of the International Service Regulations imposes the general obligation of not interfering with reception of weather bulletins by other ships.

10. Certain other stations not shown in the schedule supply weather bulletins on demand, generally at reduced charges. Particulars will be found in the Berne List.

Schedule of wireless weather bulletins.

Wireless station. (1.)	Call letters. (2.)	Time (G. M. T.). (3.)	Wave (meters). (4.)
Australasia:			
Adelaide radio.....	VIA	0900, 1030	600
Brisbane radio.....	VIB	1230, 1300	600
Hobart radio.....	VIH	1200	600
Melbourne radio.....	VIM	0930, 1100	600
Sydney radio (Pennant Hills).....	VIS		600
Awanui radio.....	VLA	(1)	(1)
Awarua radio.....	VLB		
Wellington radio.....	VLW		
Chatham Island.....	VLC		
Masquarie Island radio.....	VIQ		
Brazil:			
Illa do Governador.....	SOH	* 0000	1800
China:			
Shanghai—Zikawei.....	FFZ	* 0300, 0900	600
France:			
Eiffel Tower.....	FL	* 0945, * 2330	2500

¹ No details.

² Weather bulletin follows a time signal.

³ Weather bulletin is followed by time signal.

Schedule of wireless weather bulletins—Continued.

Wireless station. (1.)	Call letters. (2.)	Time (G. M. T.). (3.)	Wave (meters). (4.)
French Oceania:			
Papeete, Ile Tahiti.....	FOP	1100, 2300	600
Germany:			
Norddeich.....	KAV	¹ 1200, 2200	1650
Great Britain:			
Poldhu.....	MPD	0930, 2130	2700
Cleethorpes.....	BYB	0500, 1700	3000
Cleethorpes "Northern".....	BYB	0000	3000
Cleethorpes "Scandinavia".....	BYB	1300	3000
Hawaiian Islands:			
Pearl Harbor.....	NPM	{ 0230, 0630 1830, 2230 }	600
Holland:			
Scheveningen.....	PCH	1115, 2315	1800
India:			
Calcutta radio.....	VWC	¹ 0730, 1910	2000
Karachi radio.....	VWK	{ 0730, 1910	2000
Rangoon radio.....	VTR		1200
Bombay radio.....	VMB	{ 0740, 1920	2000
Madras radio.....	VWM		2000
Port Blair.....	VTP		1200
Japan:			
Choshi.....	JCS	¹ 1200	600
Dairenwan.....	JDA	1200	600
Fukukaku.....	JKF	1130	600
Mediterranean:			
Rinella.....	BYZ	2100	2700
Mexico:			
Campeche.....	XAB	{ ¹ 1837	600
Guayamas.....	XAH		
Mazatlan de Sinaloa.....	XAE		
Payo Obispo.....	XAC		
Vera Cruz.....	XAA		
Samoa:			
Tutuila.....	NPU	{ 0330, 0730 1930, 2330 }	600
South Africa:			
Capetown radio.....	MNC	1115	600
Durban radio.....	VND	1115	600
Spain:			
Madrid.....	EGC	1330	2000
United States:			
Washington (Arlington).....	NAA	¹ 0300 and ¹ 1700	2500
Annapolis.....	NBR	0130, 1330	1700
Key West.....	NAR	¹ 0300	1500
San Francisco.....	NPH	¹ 0600	600 and 950
North Head.....	NPE	0600	600 and 950
San Diego.....	NPL	0600	600 and 950

¹ Weather bulletin follows a time signal.

NOTE.—This Notice will be subject to revision from time to time.

(Notice No. 478 of 1920.)

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, July 1, 1920—No. 39

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of Aug. 15, 1919) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Avalon, Calif.....	KUXV				Pacific Telephone & Telegraph Co.
Batangas, P. I.....	KUXK				Philippine Insular Government.
Cebu, P. I.....	KUXJ				Do.
Cheboygan, Mich.....	KUXM	300, 450, 600	PR	X	Warren W. Kathan.
Chicago, Ill.....	WGO	300, 600, 2000	PR	(¹)	Inter-City Radio Co.
Dallas, Tex. ²	KUXP	300, 425, 600, 1650	PR	N	Continental Radio Telegraph & Telephone Co.
Fairport, Va.....	KDAH				C. E. Davis Packing Co.
Hog Island, Pa.....	KDAB		P	X	American International Shipping Corporation.
Iloilo, P. I.....	KUVM				Philippine Insular Government.
Johnswood, Mich.....	KUVQ	300, 450, 600	PR	X	Kreetan Co.
Jordan, Mont. ³	KUVR	600	PR	(⁴)	Miles City-Jordan Wireless Co.
Kaunakakai, Hawaii ⁷	KHO	300, 400, 600	PR	(⁶)	Mutual Telephone Co.
Kawaihae, Hawaii ⁵	KHN	300, 500, 600	PR	(⁶)	Do.
Lahaina, Hawaii ⁶	KHL	300, 500, 600	PR	(⁶)	Do.
Lihue, Hawaii ⁵	KHM	300, 500, 600	PR	(⁶)	Do.
Long Beach, Calif.....	KUXT				Pacific Telephone & Telegraph Co.
Malangas, P. I.....	KUXG				Philippine Insular Government.
Miles City, Mont. ³	KUXN	600	PR	(⁴)	Miles City-Jordan Wireless Co.
New York, N. Y.....	KUVS	300, 400, 600	PR	N	Police department of New York City.
New York, N. Y. ⁸	WNY	300, 450, 600	PG	N	Radio Corporation of America.
Wichita Falls, Tex. ¹	KUXQ	1750	PR	N	Continental Radio Telegraph & Telephone Co.

¹ Hours, 8.30 a. m. to 5 p. m.

² Rates, 3 cents per word, minimum 30 cents for 10 words.

³ Rates, 5 cents per word, minimum 75 cents; day letter of 50 words, \$1.50, each additional 10 words 25 cents; night letter of 50 words, 75 cents; for each additional 10 words, 15 cents.

⁴ Hours, 8 a. m. to 6 p. m.

⁵ Rates, interisland, 15 cents per word, no minimum; interisland night letter of 24 words, \$1; each additional word, 4 cents; ship messages sent through Wahiawa only, 4 cents per word.

⁶ Hours, 7 a. m. to 5.30 p. m.

⁷ Rates, interisland, 15 cents per word, no minimum; interisland night letter of 24 words, \$1; each additional word 4 cents; ship messages sent through Wahiawa and Lahaina, 4 cents per word.

⁸ Rates, ship service, 6 cents per word.

⁹ Hours, 7 a. m. to 12 p. m.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		<i>Cents.</i>	<i>Cents.</i>				
Agron.....	KUVJ	4	4	PG	X	U. S. Shipping Board.	
Agwisun.....	KDAD			PG		Atlantic, Gulf & West Indies S. S. Co.	
Agylla.....	KUXS			PG			
Anahuac.....	KUZL	4	4	PG	X	U. S. Shipping Board.	
Argus.....	KUVD			PG		Nafra Co.	
Broxton.....	KDAL			PG			
Capulin.....	KUZR	4	4	PG	X	U. S. Shipping Board.	
Cardonia.....	KUVV	4	4	PG	X	do.	
Carib.....	KUZZ	4	4	PG	X	Carib Trading Co.	S. O. R. S.
Cayo Mambi.....	KUZZ			PG			
City of Weatherford.....	KUVC	4	4	PG	X	U. S. Shipping Board.	
Cristina.....	KUZB	4	4	PG	X	Vincent Astor.....	R. C. of A.
Cuyamaca.....	KUXD	4	4	PG	X	U. S. Shipping Board.	
Domingo Nazara 1.....	KUVN			PG			
Dungannon.....	KUZV	4	4	PG		U. S. Shipping Board.	
Eastern Sailor.....	KUZT	4	4	PG		do.	I. W. T. Co.
Eastern Tempest.....	KUVG	4	4	PG	X	do.	S. O. R. S.
Ensely City.....	KUZS			PG			
Fish Cannery No. 1.....	KDAK			PG		Fish Cannery Co.	
Hahira.....	KUZC	4	4	PG	X	U. S. Shipping Board.	
Half Moon.....	KUVX	4	4	PG	N	do.	
Hastnal.....	KUVP			PG		National Oil Transport Co.	
Hayden.....	KUZP	4	4	PG		U. S. Shipping Board.	
Honedaga.....	KUZZ	4	4	PG	N	do.	
Jim Sid.....	KUZD			PG	X	Gulf Barge & Towing Co.	
John Jay.....	KUXR	4	4	PG		U. S. Shipping Board.	I. W. T. Co.
Jolee.....	KUVT	4	4	PG	X	do.	
Loretta.....	KUXF	4	4	PG			R. C. of A.
Manuel Rionda.....	KUXX			PG	X	Sinclair Navigation Co.	
M. Mitchell Davis.....	KDAG			PG		C. E. Davis Packing Co.	Owner of vessel.
N. & K. No. 2.....	KDAJ					Fish Cannery Co.	
Pansa.....	KUZN	4	4	PG		U. S. Shipping Board.	R. C. of A.
Peconic.....	KDAF					C. E. Davis Packing Co.	Owner of vessel.
Quillwark.....	KUZM	4	4	PG		U. S. Shipping Board.	
Salina.....	KUZQ	4	4	PG	X	do.	
San Pasqual.....	KUXC	4	4	PG	X	do.	
Sebonac.....	KUVF	4	4	PG	X	Thomas A. Howell.....	Owner of vessel.
Sinasta.....	KDAC	4	4	PG		U. S. Shipping Board.	
Steel Mariner.....	KUVK			PG	N	U. S. Steel Products Co.	
Steel Trader.....	KUVL			PG	N	do.	
Suelco.....	KUZJ			PG		Submarine Boat Corporation.	
Suholco.....	KUZF			PG		do.	
Suportco.....	KUZK			PG		do.	
Sutransco.....	KUZG			PG		do.	
Tippecanoe.....	KUXL	4	4	PG	N	U. S. Shipping Board.	
West Holbrook.....	KUXB	4	4	PG	X	do.	
West Kebar.....	KDAN	4	4	PG	N	do.	
West Kedron.....	KDAP	4	4	PG	N	do.	
West Norranus.....	KUVZ	4	4	PG	X	do.	
West Notus.....	KDAM	4	4	PG	X	do.	
William B. Livingstone.....	KDAQ			PG		Montreal Transit Co.	R. C. of A.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDAB	Hog Island, Pa.....c	KUXD	Cuyamaca.....b
KDAC	Snasta.....b	KUXF	Loretta.....b
KDAD	Agwisun.....b	KUXG	Malangas, P. I.....c
KDAF	Peconic.....b	KUXJ	Cebu, P. I.....c
KDAG	M. Mitchell Davis.....b	KUXK	Batangas, P. I.....c
KDAH	Fairport, Va.....c	KUXL	Tippecanoe.....b
KDAJ	N. & K. No. 2.....b	KUXM	Cheboygan, Mich.....c
KDAK	Fish Cannery No. 1.....b	KUXN	Miles City, Mont.....c
KDAL	Broxton.....b	KUXP	Dallas, Tex.....c
KDAM	West Notus.....b	KUXQ	Wichita Falls, Tex.....c
KDAN	West Kebar.....b	KUXR	John Jay.....b
KDAP	West Kedron.....b	KUXS	Agylla.....b
KDAQ	William B. Livingstone.....b	KUXT	Long Beach, Calif.....c
KHL	Lahaina, Hawaii.....c	KUXV	Avalon, Calif.....c
KHM	Lihue, Hawaii.....c	KUXX	Manuel Rionda.....b
KHN	Kawahae, Hawaii.....c	KUXZ	Honnedaga.....b
KHO	Kaunakakai, Hawaii.....c	KUZB	Cristina.....b
		KUZC	Hahira.....b
KUVC	City of Weatherford.....b	KUZD	Jim Sid.....b
KUVD	Argus.....b	KUZF	Suholco.....b
KUVF	Sebonac.....b	KUZG	Sutransco.....b
KUVG	Eastern Tempest.....b	KUZJ	Suelco.....b
KUVJ	Agron.....b	KUZK	Suportco.....b
KUVK	Steel Mariner.....b	KUZL	Anahuac.....b
KUVL	Steel Trader.....b	KUZM	Quillwark.....b
KUVM	Iloilo, P. I.....c	KUZN	Pansa.....b
KUVN	Domingo Nazara I.....b	KUZP	Hayden.....b
KUVP	Hastnal.....b	KUZQ	Sallna.....b
KUVQ	Johnswood, Mich.....c	KUZR	Capulln.....b
KUVR	Jordan, Mont.....c	KUZS	Ensely City.....b
KUVS	New York, N. Y.....c	KUZT	Eastern Sallor.....b
KUVT	Jolee.....b	KUZV	Dungannon.....b
KUVV	Cardonia.....b	KUZX	Carib.....b
KUVX	Half Moon.....b	KUZZ	Cayo Mambi.....b
KUVZ	West Norranus.....b		
KUXB	West Holbrook.....b	WGO	Chicago, Ill.....c
KUXC	San Pasqual.....b	WNY	New York, N. Y.....c

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Bainbridge.....	NUQL	Pillsbury.....	NUQQ
Cadmus.....	WUAB	Taconv.....	WUAE
Ford.....	NUQJ	Torpedo Test Barge No. 3.....	NIFX
Gwalla.....	WUAD	Torpedo Test Barge No. 4.....	NIFZ
Gypsum Prince.....	WUAC	U. N. Truxtun.....	NUQK
Hopkins.....	NUQM		

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; c—land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NIFX	Torpedo Test Barge No. 3.....b	NUQM	Hopkins.....b
NIFZ	Torpedo Test Barge No. 4.....b		
NUQG	Pillsbury.....b	WUAB	Cadmus.....b
NUQJ	Ford.....b	WUAC	Gypsum Prince.....b
NUQK	U. N. Truxtun.....b	WUAD	Gwalla.....b
NUQL	Bainbridge.....b	WUAE	Tacony.....b

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 15, 1919, only.]

Station.	Call signal.	Station controlled by—
Bear Creek, Mont.....	7ZG	Winfred E. Slauson.
Brooklyn, N. Y.....	2XT	Lowenstein Radio Co.
Burley, Idaho.....	7YF	Burley High School.
Burrwood, La.....	5XE	Tropical Radio Telegraph Co.
Cambridge, Mass.....	1XM	Massachusetts Institute of Technology.
Cincinnati, Ohio.....	8ZJ	Hughes High School.
Dearborn, Mich.....	8XD	Henry Ford.
Detroit, Mich.....	8ZN	George W. Carter.
Fresno, Calif.....	6XU	San Joaquin Light & Power Corporation.
Houston, Tex.....	5YI	Rice Institute.
Kansas City, Mo.....	9ZZ	Walter M. Aronson and Albert R. Perkins.
La Crosse, Wis.....	9ZY	Ben A. Ott.
Lewisburg, Pa.....	8XJ	Bucknell University.
Los Angeles, Calif.....	6ZG	Forbes W. Van Why.
Mesilla Park, N. Mex.....	5ZJ	R. W. Goddard.
Middletown, Conn.....	1XN	Walter G. Cady.
Norfolk, Va.....	3YD	Norfolk Radio School.
Northville, Mich.....	8XL	Henry Ford.
Omaha, Nebr.....	9YP	High School of Commerce.
Philadelphia, Pa.....	3XI	Lester R. Damon.
Pittsburgh, Pa.....	8ZO	Frank Moore, jr.
Portland, Oreg.....	7YG	Young Men's Christian Association.
Portland, Oreg.....	7ZI	Charles L. Austin.
San Francisco, Calif.....	6XT	Baruch Research Laboratories.
Seattle, Calif.....	6XS	R. B. Ashbrook.
Seattle, Wash.....	7XK	Kilbourne & Clark Manufacturing Co.
Seattle, Wash.....	7YE	City of Seattle School District.
Staunton, Va.....	3YE	Staunton Military Academy.
Urbana, Ill.....	9XJ	University of Illinois.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XM	First district:	7XK	Seventh district:
1XN	Cambridge, Mass.	7YE	Seattle, Wash.
2XT	Middletown, Conn.	7YF	Seattle, Wash.
	Second district: Brooklyn, N. Y.	7YG	Burley, Idaho.
	Third district:	7ZG	Portland, Oreg.
3XI	Philadelphia, Pa.	7ZI	Bear Creek, Mont.
3YD	Norfolk, Va.		Portland, Oreg.
3YE	Staunton, Va.		
	Fifth district:	8XD	Eighth district:
5XE	Burrwood, La.	8XJ	Dearborn, Mich.
5YI	Houston, Tex.	8XL	Lewisburg, Pa.
5ZJ	Mesilla Park, N. Mex.	8ZJ	Northville, Mich.
	Sixth district:	8ZN	Cincinnati, Ohio.
6ZG	Los Angeles, Calif.	8ZO	Detroit, Mich.
6XS	San Gabriel, Calif.		Pittsburgh, Pa.
6XT	San Francisco, Calif.		
6XU	Fresno, Calif.	9XI	Ninth district:
		9YP	Urbana, Ill.
		9ZY	Omaha, Nebr.
		9ZZ	La Crosse, Wis.
			Kansas City, Mo.

ALTERATIONS AND CORRECTIONS.**COMMERCIAL SHIP STATIONS. ALPHABETICALLY BY NAMES OF STATIONS.**

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

BALCATT. — Pacific Motorship Co., owner of vessel.
 CALLABASAS. — Callabassas S. S. Corporation, owner of vessel.
 CUBA. — Station operated and controlled by Federal Telegraph Co.
 DEFENDER. — Name changed to Montana.
 GLYNDON. — Glyndon S. S. Corporation, owner of vessel.
 JAMESTOWN. — Station operated and controlled by owner of vessel.
 KATRINA LUCKENBACH. — Luckenbach S. S. Co., owner of vessel.
 LAKE LILLIAN. — International Coal Transportation Corporation, owner of vessel.
 LAKE TULARE. — International Coal Transportation Corporation, owner of vessel; station operated and controlled by I. W. T. Co.
 MERIDEN. — General S. S. Corporation, owner of vessel.
 MILLER COUNTY. — U. S. Shipping Board, owner of vessel.
 NEPTUNE. — Hours, X; rates, 8 cents per word for all classes of service; station operated and controlled by Wireless Service Co., care of John Beninato, 209 Whitney Building, New Orleans, La.
 PENTHIS. — *Read* Pinthis; station operated and controlled by Cutting & Washington.
 RESCUE. — Rates, North and South American, 4 cents per word.
 RICHMOND BORO. — Name changed to Willfaro.

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE SHIP OWNERS RADIO SERVICE (INC.).

Astmahco III.	Lake Elsay.	Okiya.
Fonduco.	Lake Galien.	Quinnipiac.
Kickapoo.	Moosabee.	Rainier.
Lake Elmont.	Noddle Island.	Schuykill Bridge.

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE RADIO CORPORATION OF AMERICA.

Anthracite Bridge.	Lake Flag.	Santa Elisa.
City of Vernon.	Lake Floravista.	Sepulga.
Eastern Maid.	Lake Gert.	Sioux Falls.
Fargo.	Lake Geyser.	Sophie Frankel.
Glen White.	Miller County.	Springfield.
Haxtum.	Oronoke.	West Camak.
Himoto.	Pittsburgh Bridge.	West Nomentum.
La Crosse.	Rochester.	

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE INDEPENDENT WIRELESS TELEGRAPH CO.

Arcturus.	Greenwood.	Neshobee.
Biran.	Henry County.	Occidental.
Castlewood.	Hukey.	Pallas.
Chappagua.	Kehuku.	Pinellas.
City of Joliet.	Lake Elva.	Richconcal.
Coosa.	Lake Fenn.	Wheeling Mold.
Delco.	Lake Filbert.	Yellowstone.
Eastern Glen.	Lake Treba.	Yuma.
Franklin County.	Maddequet.	

Strike out all particulars of the following-named vessels:

Augusta.	Lynchburg.	Santa Isabel.
Berwyn.	Nanquitt.	Vigo.
Fire Island.		

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KITX, *read* Willfarø; KOJF, *read* Montana; KUPC, *read* Pinthis. Strike out all particulars following the call signals, KMC, KMO, KODJ, KUQV, WFUO, WHN, and WLIE.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 15, 1919.]

Charles.—Strike out all particulars.
 Gloucester.—Strike out all particulars.
 Jupiter.—*Read* Langley.
 Montana.—*Read* Missoula.
 North Carolina.—*Read* Charlotte.
 Rockport.—Strike out all particulars.
 South Dakota.—*Read* Huron.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NBH, strike out all particulars; NKM, *read* Missoula; NMN, *read* Charlotte; NNC, *read* Langley; NSL, strike out all particulars; NSX, *read* Huron, and NAXV, strike out all particulars.

MISCELLANEOUS.

OPERATOR'S LICENSE SUSPENDED.

License No. 19046, issued at New York, September 14, 1919, has been suspended for a period of three months on account of the holder of the license violating Article VI of the service regulations of the International Convention. The offending operator in this case caused superfluous signals to be transmitted, and had it not been for his previous good record he would not have been dealt with so leniently.

REPETITION OF PRESS TRAFFIC.

The Bureau is in receipt of information and extracts of logs that indicate that one of the greatest sources of interference with commercial traffic at sea is the repetition of press originally transmitted by American stations. From the information received it is apparent that much of this interference is caused by operators not listening in at the proper time, as they should do. In cases where press can not be received on account of interference or other causes an operator may request a station near by to repeat the message on 300 meters. If this is not possible, then 450 meters may be used; but 600 meters should never be used for this purpose.

Herewith is printed a joint resolution of Congress for the information of all concerned:

[PUBLIC RESOLUTION—No. 48—66TH CONGRESS.]

[S. J. Res. 170.]

Joint Resolution To authorize the operation of Government owned radio stations for the use of the general public, and for other purposes.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That all land, ship, and airship radio stations, and all apparatus therein owned by the United States may be used by it for receiving and transmitting messages relating to Government business, compass reports, and the safety of ships.

Sec. 2. That the Secretary of the Navy is hereby authorized, under terms and conditions and at rates prescribed by him, which rates shall be just and reasonable, and which, upon complaint, shall be subject to review and revision by the Interstate Commerce Commission, to use all radio stations and apparatus, wherever located, owned by the United States and under the control of the Navy Department—(a) for the reception and transmission of press messages offered by any newspaper published in the United States, its Territories or possessions, or published by citizens of the United States in foreign countries, or by any press association of the United States, and (b) for the reception and transmission of private commercial messages: *Provided*, That the rates fixed for the reception and transmission of commercial messages, other than press messages, shall not be less than the rates charged by privately owned and operated stations for like messages and service: *Provided further*, That the right to use such stations for any of the purposes named in this section shall terminate and cease as between any countries or localities or between any locality and privately operated ships, whenever privately owned and operated stations are capable of meeting the normal communication requirements between such countries or localities or between any locality and privately operated ships, and the Secretary of Commerce shall have notified the Secretary of the Navy thereof, and all rights conferred by this section shall terminate and cease in any event two years from the date this resolution takes effect.

Sec. 3. That all stations owned and operated by the Government, except as herein otherwise provided, shall be used and operated in accordance with the provisions of the Act of Congress entitled "An Act to regulate radio communication," approved August 13, 1912.

Approved, June 5, 1920.

HYDROGRAPHIC INFORMATION.

Information concerning wrecks, derelicts, ice, and other dangerous obstructions to navigation whenever received from the Hydrographic Office or from a branch hydrographic office or other reliable source is sent broadcast four times daily, viz, at 8 a. m., noon, 4 p. m., and 8 p. m., local (standard) time of station. Ships within range of a naval radio station should be prepared to receive these hydrographic messages at the hours mentioned and should avoid sending radio messages at these times. One vessel sending may prevent several others receiving information necessary to their safety.

Naval radio stations will furnish this information to passing vessels on request, whenever practicable, at other hours than those mentioned above. Should it not be practicable to send out this information on one of the hours scheduled it will be held until the next scheduled time and sent out as soon as practicable after each hour scheduled.

Each day at noon and 10 p. m., seventy-fifth meridian, immediately following the time signal, the Naval Radio Station at Washington, D. C., will broadcast such information relating to safe navigation as may be furnished it by the Hydrographic Office during the preceding 24 hours. The same wave length, 2,500 meters, used in the time signal will be employed.

TRANSMISSION OF WEATHER REPORTS BY NAVAL RADIO STATIONS.

Through cooperation with local offices of the United States Weather Bureau, weather forecasts are sent broadcast to sea through naval coast radio stations at certain times, varying with the locality, as described below. Coast stations are generally prepared to give local forecasts to passing vessels without charge, on request.

ATLANTIC COAST.

Sent by Washington (NAA) on 2,500 meters wave length and Key West (NAR) on 1,500 meters wave length immediately following 10 p. m. time and hydrographic information (seventy-fifth meridian time).

The coast line is divided as follows:

North Atlantic, Halifax to New York; middle Atlantic, New York to Hatteras; south Atlantic, Hatteras to Key West; east Gulf, Key West to mouth of Mississippi; west Gulf, mouth of Mississippi to mouth of Rio Grande.

This bulletin consists of two parts, the first part containing code letters and figures expressing the actual weather conditions at 8 p. m., seventy-fifth meridian time, on the day of distribution at certain points along the eastern coast of North America, one point along the coast of the Gulf of Mexico, and one at Bermuda. The second part contains a special forecast of the probable winds to be experienced a hundred miles or so offshore. The second part of the bulletin also contains certain warnings of severe storms along the coast whenever occasion arises.

The points for which weather conditions are furnished by the above bulletin are designated respectively by their initial letter, except in the case of Nantucket, for which the letter T is used; accordingly, S=Sydney, T=Nantucket, DB=Delaware Breakwater, H=Hatteras, C=Charleston, K=Key West, P=Pensacola, and B=Bermuda.

GREAT LAKES.

Sent by Great Lakes (NAJ) on 1,512 meters and Washington (NAA) on 2,500 meters immediately following 10 p. m. time and hydrographic information (ninetieth meridian time).

This bulletin is sent in a similar manner to the one sent out for the Atlantic coast, except the first part expresses the actual weather conditions at 7 p. m., ninetieth meridian time, on the day of distribution at certain points on the Great Lakes. These points are designated as follows: Du=Duluth, M=Marquette, U=Sault Sainte Marie, G=Green Bay, Ch=Chicago, L=Alpena, D=Detroit, V=Cleveland, and F=Buffalo.

This grouping begins on Lake Superior and ends on Lake Erie.

The second part contains a special forecast of the probable winds to be experienced on the Lakes.

Lakes Superior, Michigan, and Huron are considered the upper lakes, and Lakes Erie and Ontario the lower lakes.

All bulletins begin with the letters U. S. W. B. (United States Weather Bureau) and the weather conditions follow. The first three figures of a report represent the barometric pressure in inches (002=30.02); the next figure, the fourth in sequence, represents the direction of the wind to the eight points of the compass: 1=north,

2 = northeast, 3 = east, 4 = southeast, 5 = south, 6 = southwest, 7 = west, 8 = northwest, and 0 = calm. The fifth figure represents the force of the wind on the Beaufort scale following:

Beaufort scale of wind force.

Number and designation.	Statute miles per hour.	Nautical miles per hour.
0 Calm.....	0 to 3	0 to 2.5
1 Light air.....	8	6.9
2 Light breeze.....	13	11.3
3 Gentle breeze.....	18	15.6
4 Moderate breeze.....	23	20.0
5 Fresh breeze.....	28	24.3
6 Strong breeze.....	34	29.5
7 Moderate gale.....	40	34.7
8 Fresh gale.....	48	41.6
9 Strong gale.....	56	48.6
10 Whole gale.....	65	56.4
11 Storm.....	75	65.1
12 Hurricane.....	90 and over.	78.1 and over.

In order to simplify the code, no provision has been made for wind force greater than 9, strong gale, on the Beaufort scale. Whenever winds of force greater than 9 occur the number representing them is given in words instead of figures, thus: Ten, eleven, etc.

EXAMPLES OF CODE.

U S W B S 96465 T 91674 DB 94686 H 99886 C 01214
K 02622 P 03613 B 00065.

Translation.

United States Weather Bureau.

Station.	Pressure.	Wind.	
		Direction.	Force. ¹
Sydney.....	29.64	SW	5
Nantucket.....	29.16	W	4
Delaware Breakwater.....	29.46	NW	6
Hatteras.....	29.98	NW	6
Charleston.....	30.12	N	4
Key West.....	30.26	NE	2
Pensacola.....	30.36	N	3
Bermuda.....	30.00	SW	6

¹ See Beaufort scale.

U S W B Du 95826 M 97635 U 00443 G 96046 Ch 95667
L 00644 D 00842 V 01054 F 01656

Translation.

United States Weather Bureau.

Station.	Pressure.	Wind.	
		Direction.	Force. ¹
Duluth.....	29.58	NE	6
Marquette.....	29.76	E	5
Sault Ste. Marie.....	30.04	SE	3
Green Bay.....	29.60	SE	6
Chicago.....	29.56	SW	7
Alpena.....	30.06	SE	4
Detroit.....	30.06	SE	3
Cleveland.....	30.10	S	4
Buffalo.....	30.16	S	6

¹ See Beaufort scale.

PACIFIC COAST.

Weather bulletins are obtained from the Weather Bureau, San Francisco, by the San Francisco Naval Radio Station at about 8.30 a. m. and 6 p. m. and forwarded by radio to North Head and San Diego as soon as practicable. Same is broadcasted by San Francisco, North Head, and San Diego at noon and 10 p. m. on 952 meters immediately after transmission of time signals. Hydrographic information and storm warnings are broadcasted immediately upon receipt by Tatoosh, Puget Sound, North Head, Marshfield, San Francisco, and Point Arguello on 600 and 952 meters in succession, and also after broadcasting local weather report. Local weather reports broadcasted by Tatoosh, North Head, San Francisco, and San Diego at 8 a. m. and 4 p. m. on 600 meters and at noon and 10 p. m. 952 meters; and at noon and 10 p. m. by Puget Sound, Marshfield, and Point Arguello on 600 meters. Total weather report from Farallones Islands is forwarded to San Francisco for Marine Exchange at 8 a. m., noon, and 5 p. m.

The daily bulletin broadcasted by San Francisco, North Head, and San Diego will consist of two parts. The first part will contain code words and figures which will express the actual weather conditions at 5 p. m. (one hundred and twentieth meridian time) on the day of distribution at certain points along the western coast of the United States. The second part of the bulletin will contain a special forecast of the probable winds to be experienced a hundred miles or so offshore, made by the United States Weather Bureau, San Francisco, for distribution to shipmasters by naval radio as above. The second part of the bulletin will also contain warnings of severe storms along the coast as occasion may arise.

The points on the Pacific coast from which weather conditions will be furnished will be designated, respectively, by their initial letter:

T=Tatoosh.
NH=North Head.
E=Eureka.
SF=San Francisco.
SD=San Diego.

The bulletin will begin with the letters "U S W B S F," signifying United States Weather Bureau, San Francisco, and the weather conditions will follow. The first three figures of a report will represent the barometric pressure in inches ($964 = 29.64$); the next figure, the fourth in sequence, will represent the direction of the wind to eight points of the compass:

1=North.
2=Northeast.
3=East.
4=Southeast.
5=South.
6=Southwest.
7=West.
8=Northwest.
0=Calm.

The fifth figure will represent the force of the wind on the Beaufort scale.

If the weather conditions for any station can not be supplied, the initial of the station will be given, followed by the word "Missing"; and if any portion of a report can not be furnished, such portion will be replaced by an equivalent number of letters, X.

The coast line of the western part of the United States will be divided as follows:

Northern Pacific, Tatoosh to Cape Blanco.
Central Pacific, Cape Blanco to Point Arguello.
Southern Pacific, Point Arguello to San Diego.

The forecast and warning will be in ordinary language, and will cover a period of 24 hours from 5 p. m., date of issue. At the end of the forecast a statement will be made in regard to the location and movement of any barometric depression that may be likely to affect the winds over the ocean.

Example of forecast and warnings:

Northern Pacific missing Central Pacific Wednesday rain heavy southeast winds
Southern Pacific moderate southerly winds period Southeast storm warnings displayed Pointarguello to Capeblanco.

HAWAII.

Weather bulletins obtained from the United States Weather Bureau at Honolulu are broadcasted daily by the Pearl Harbor Radio Station at 8 a. m., noon, 4 p. m., and 8 p. m., local time.

TUTUILA, SAMOA.

Local weather bulletins preceded by the letter "T" are broadcasted by the Tutuila Naval Radio Station at 8 a. m., noon, 4 p. m., and 8 p. m., local time.

TRANSMISSION OF TIME SIGNALS BY NAVAL RADIO STATIONS.

The transmission of time signals to vessels at sea by means of radiotelegraphy was first accomplished in the United States in 1905, and this service, enlarged and extended, has continued to the present time. This service is of the greatest value to mariners, as it furnishes a means by which the time, as given by the transmitted signals, may be compared with a ship's chronometer and the error of the chronometer found. Similar comparisons over a number of days enable data to be obtained by which not only the error may be found but also the chronometer rate; that is, the rate at which it is gaining or losing.

The noontime signals on the Atlantic coast are sent out through the coast radio stations by connection with Western Union telegraph lines from the United States Naval Observatory at Washington, D. C. By the operation of proper relays in electrical circuits, the beats of the seconds of a standard clock in the observatory are sent out broadcast as a series of radio dots, commencing five minutes before the time of the final signal. By omitting certain dots in a series, the comparison between the dots and the beats of the chronometer seconds can be checked until the instant of local noon (seventy-fifth meridian time) is reached. This is marked by a longer dot, which gives the time of exact noon. A comparison with the chronometer time at that instant gives its error referred to the

seventy-fifth meridian time. Applying the difference in longitude, namely, five hours, between the seventy-fifth meridian and Greenwich, which is the standard meridian (or 0° longitude), the error of the chronometer referred to Greenwich time is determined.

According to information received from the Director of Naval Communications, time signals are being transmitted by the United States Naval Radio Stations as follows:

Station.	Call letters.	Wave length.	When sent.
Washington.....	NAA	<i>Meters.</i> 12,500	Daily at 11.55 a. m. to noon, and 9.55 to 10 p. m., standard time, seventy-fifth meridian.
Annapolis.....	NSS	17,000	Daily at 11.55 a. m. to noon, and 9.55 to 10 p. m., standard time, seventy-fifth meridian.
Key West.....	NAR	11,500	Daily at 11.55 a. m. to noon, standard time, seventy-fifth meridian.
New Orleans.....	NAT	11,000	Daily at 11.55 a. m. to noon, standard time, seventy-fifth meridian.
Balboa, Panama.....	NBA	17,000	Daily at 4.55 to 5 a. m., and 12.55 to 1 p. m., standard time, seventy-fifth meridian.
Colon, Panama.....	NAX	11,500	Daily at 4.55 to 5 a. m., and 12.55 to 1 p. m., standard time, seventy-fifth meridian.
Cavite, P. I.....	NPO	1952 15,000	Daily at 10.55 to 11 a. m., and 9.55 to 10 p. m., standard time, one hundred and twentieth meridian, east.
North Head, Wash.....	NPE	12,800	Daily at 11.55 a. m. to noon, standard time, one hundred and twentieth meridian, west.
Eureka, Calif.....	NPW	12,000	Daily at 11.55 a. m. to noon, standard time, one hundred and twentieth meridian, west.
Point Arguello, Calif.....	NPK	11,512	Daily except Sundays and holidays at 11.55 a. m. to noon, standard time, one hundred and twentieth meridian, west.
San Diego, Calif.....	NPL	19,800 12,400	Daily except Sundays and holidays at 11.55 a. m. to noon, standard time, one hundred and twentieth meridian, west.
San Francisco, Calif.....	NPH	14,800 12,400	Daily at 11.55 a. m. to noon, standard time, one hundred and twentieth meridian, west.
Great Lakes, Ill.....	NAJ	11,512	Daily except Sundays and holidays at 10.55 a. m. to 11 a. m., standard time, nineteenth meridian.
Pearl Harbor, Hawaii.....	NPM	11,200 1600	Daily at one hundred and eightieth meridian, mean noon.

¹ Spark.

¹ Arc.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name	=Name of station.
G. loc.	=Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call	=Call letters assigned.
System	=Radio system used and sparks per second.
Range	=Normal range in nautical miles.
W. L.	=Wave lengths assigned: Normal wave lengths in <i>italics</i> .
Service	=Nature of service maintained: PG=General public. PR=Limited public. P =Private. O =Government business exclusively.
Hours	=Hours of operation: N =Continuous service. X =No regular hours. m =a. m. (12m=midday). s =p. m. (12s=midnight).
Rates	=Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
I. W. T. Co.	=Independent Wireless Telegraph Co.
R. C. of A.	=Radio Corporation of America.
S. O. R. S.	=Ship Owners Radio Service.
Co.	=Company.
Corpn.	=Corporation.
&	=And.

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APR 20 1925

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, August 2, 1920—No. 40

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of Aug. 15, 1919) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Rockland, Me.....	WST	300,600.....	PG	N	East Coast Fisheries Co.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Agwimoon.....	KDBC	.....	.....	PG	X	Atlantic, Gulf & West Indies Lines.	
Antinous.....	KDAX	.....	.....	PG	X	Nafra Co.....	
Apus.....	KDBZ	.....	.....	PG	X	do.....	
Cananovia.....	KDBN	.....	.....	PG	X	Cananovia S. S. Corp..	I. W. T. Co.
Chester Kiwanis.....	KDBP	4	4	PG	X	U. S. Shipping Board..	
City of Fort Worth.....	KDAW	4	4	PG	X	do.....	
Dartford.....	KDAV	4	4	PG	X	U. S.-Mex. Oil Corp....	R. C. of A.
De Kalb.....	KDBX	4	4	PG	N	U. S. Shipping Board..	
Depere.....	KDBA	4	4	PG	X	do.....	
Durango.....	KDBT	4	4	PG	X	do.....	S. O. R. S.
Eagle.....	KDBF	.....	.....	.....	.....	Wm. K. Vanderbilt, jr.	
Eastern Exporter.....	KDAZ	4	4	PG	.....	U. S. Shipping Board..	
Eastern Importer.....	KDBY	4	4	PG	.....	do.....	I. W. T. Co.
Edris.....	KDBG	.....	.....	.....	X	Thos. H. Ince.....	Owner of vessel.
Forest King.....	KDBH	.....	.....	PG	.....	Forest King Co.....	
Gold Star.....	KDBD	4	4	PG	X	U. S. Shipping Board..	
Haymon.....	KDBU	4	4	PG	X	do.....	
Hybert.....	KDCA	4	4	PG	.....	do.....	
Independence Hall.....	KDCG	4	4	PG	X	do.....	
James Otis.....	KDCD	4	4	PG	X	do.....	
Maude F.....	KDBK	.....	.....	P	X	E. D. Burge.....	Owner of vessel.
Meton.....	KDBM	4	4	PG	X	U. S. Shipping Board..	I. W. T. Co.
Mobile City.....	KDCE	.....	.....	PG	N	U. S. Steel Products Co.	
New Rochelle.....	KDCI	4	4	PG	N	U. S. Shipping Board..	S. O. R. S.
Pachet.....	KDCH	4	4	PG	N	do.....	
Panhandle State.....	KDAR	4	4	PG	N	do.....	
Pomona.....	KDAT	4	4	PG	X	do.....	R. C. of A.
Rock Island.....	KIND	4	4	PG	X	do.....	Do.
Rotarian.....	KDCF	4	4	PG	X	do.....	
Santa Isabel.....	KDBV	.....	.....	PG	X	American & Cuban S. S. Line.	
Sapulpa.....	KDCB	4	4	PG	X	U. S. Shipping Board..	
Sawokla.....	KDBW	4	4	PG	X	do.....	
Shelter Island.....	KDCC	4	4	PG	X	do.....	
Siskiyou.....	KDAS	.....	.....	PG	X	E. K. Wood Lumber Co.	
Snoqualmie.....	KDBO	4	4	PG	X	U. S. Shipping Board..	
Steel Worker.....	KDBJ	.....	.....	PG	N	U. S. Steel Products Co.	
Sunewco.....	KDBR	.....	.....	PG	X	Submarine Boat Corp.	
Suralleo.....	KDBS	.....	.....	PG	X	do.....	
Sutorpco.....	KDBQ	.....	.....	PG	X	do.....	
Tolosa.....	KDAY	4	4	PG	N	U. S. Shipping Board..	
Topa Topa.....	KDBB	4	4	PG	X	do.....	
Trinity.....	KDBI	4	4	PG	N	do.....	
West Camargo.....	KDBL	4	4	PG	X	do.....	

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDAR	Panhandle State.....b	KDBP	Chester Kiwanis.....b
KDAS	Siskiyou.....b	KDBQ	Sutorpco.....b
KDAT	Pomona.....b	KDBR	Sunewco.....b
KDAV	Dartford.....b	KDBS	Surailco.....b
KDAW	City of Fort Worth.....b	KDBT	Durango.....b
KDAX	Antinous.....b	KDBU	Haymon.....b
KDAY	Tolosa.....b	KDBV	Santa Isabel.....b
KDAZ	Eastern Exporter.....b	KDBW	Sawokla.....b
KDBA	Depere.....b	KDBX	De Kalb.....b
KDBB	Topa Topa.....b	KDBY	Eastern Importer.....b
KDBC	Agwimoon.....b	KDBZ	Apus.....b
KDBD	Gold Star.....b	KDCA	Hybert.....b
KDBF	Eagle.....b	KDCB	Sapulpa.....b
KDBG	Ebris.....b	KDCC	Shelter Island.....b
KDBH	Forest King.....b	KDCD	James Otis.....b
KDBI	Trinity.....b	KDCE	Mobile City.....b
KDBJ	Steel Worker.....b	KDCF	Rotarian.....b
KDBK	Maude F.....b	KDCG	Independence Hall.....b
KDBL	West Camargo.....b	KDCH	Pachet.....b
KDBM	Meton.....b	KDCI	New Rochelle.....b
KDBN	Cananova.....b	KIND	Rock Island.....b
KDBO	Snoqualmie.....b	WST	Rockland, Me.....c

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Fort Stevens, Oreg.....	NPE	

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Barry.....	NUQP	Montana.....	NISJ
Decatur.....	NUQV	North Carolina.....	NISK
Hull.....	NUQT	Paul Jones.....	NUQN
Lawrence.....	NUQQ	Perry.....	NUQS
MacDonough.....	NUQR	South Dakota.....	NISG

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NISG	South Dakota.....b	NUQQ	Lawrence.....b
NISJ	Montana.....b	NUQR	MacDonough.....b
NISK	North Carolina.....b	NUQS	Perry.....b
NPE	Fort Stevens, Oreg.....c	NUQT	Hull.....b
NUQN	Paul Jones.....b	NUQV	Decatur.....b
NUQP	Barry.....b		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, only.]

Station.	Call signal.	Station controlled by—
Chicago, Ill.....	9YE	Tilden Technical High School.
Evanston, Ill.....	9YH	Evanston High School.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name = Name of station.
 G. loc. = Geographical location: O=west longitude, N=north latitude, S=south latitude.
 Call = Call letters assigned.
 System = Radio system used and sparks per second.
 Range = Normal range in nautical miles.
 W. L. = Wave lengths assigned: Normal wave lengths in italics.
 Service = Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P =Private.
 O =Government business exclusively.
 Hours =Hours of operation:
 N =Continuous service.
 X =No regular hours.
 m =a. m. (12m=midday).
 s =p. m. (12s=midnight).
 Rates =Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
 I. W. T. Co. =Independent Wireless Telegraph Co.
 R. C. of A. =Radio Corporation of America.
 S. O. R. S. =Ship Owners Radio Service.
 Co. =Company.
 Corpn. =Corporation.
 & =And.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

- AGWISUN.—Station operated and controlled by I. W. T. Co.
 ASOTIN.—Station operated and controlled by I. W. T. Co.
 AVALON.—Wilmington Transportation Co. owner of vessel.
 CAYO MAMBI.—Cayo Mambi S. S. Corporation owner of vessel; station operated and controlled by I. W. T. Co.
 CHAMPION.—Name changed to Montauk.
 CIRCINUS.—Green Star S. S. Corporation owner of vessel.
 CORVUS.—Green Star S. S. Corporation owner of vessel.
 D'ARBONNE.—Name changed to Warwick.
 DARDEN.—U. S. Mex. Oil Corporation owner of vessel.
 E. G. CROSBY.—Name changed to Pilgrim.
 ENSLEY CITY.—Correct name Ensley City.

HANCOCK COUNTY.—Station operated and controlled by I. W. T. Co.
HENRY COUNTY.—U. S. Shipping Board owner of vessel.
HONOLULU.—Station operated and controlled by I. W. T. Co.
LAKE FEODORA.—Station operated and controlled by I. W. T. Co.
LAKE HARMINIA.—Station operated and controlled by R. C. of A.
MOOSITAUKE.—Station operated and controlled by R. C. of A.
NEMAHA.—Station operated and controlled by R. C. of A.
PANUCO (KMM).—Sinclair Navigation Co. owner of vessel.
PYLOS.—Station operated and controlled by R. C. of A.
SAINT FRANCIS.—Name changed to San Francisco.
SANTA MALTA.—Atlantic & Pacific S. S. Co. owner of vessel.
VALLONIA.—Station operated and controlled by R. C. of A.
WATERBURY.—Station operated and controlled by I. W. T. Co.

Strike out all particulars of the following-named vessels:

Astoria.	Fishers Island.	Rock Island Bridge.
Carib (KMIA).	Lake Frampton.	Roman.
Domingo Nazaral 1.	Madison.	Staten Island.
Elkwater.	Nanshon.	Wisteria.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KESX, *read* Warwick; **KIXV,** *read* Montauk; **KRT,** *read* San Francisco; **KURS,** *read* Pilgrim; and **KUZS,** *read* Ensley City. Strike out all particulars following the call signals: **KILS, KMIA, KOG, KOJN, KORN, KUMD, KUPZ, KUTL, KUVN, WCUI, WRII, and WRL.**

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920.]

INGLEWOOD, CALIF.—Call changed to NPX.

Strike out all particulars of the following-named stations:

Corfu, Greece.	New Orleans, La. (NJK).
Boston, Mass.	New York, N. Y.
Fire Island, N. Y. (NAG).	

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1920.]

U. N. TRUXTUN.—*Read* Truxtun.

YALE.—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NWR, *read* NPX; and **NUQK** *read* Truxtun. Strike out all particulars following the call signals: **NAD, NAG, NAH, NBC, NJK, and NOQ.**

SPECIAL LAND STATIONS, BY NAME OF STATIONS.

SAVANNAH, GA.—3YB changed to 4YB.

Strike out all particulars of the following-named stations:

Los Altos, Calif., 6XY.
Oakland, Calif., 6XC.
San Francisco, Calif., 6XO.

MISCELLANEOUS.**OPERATOR'S LICENSE CANCELED.**

License No. 17736 issued at New York has been canceled on account of the holder of the license violating section 5 of the act of August 13, 1912, and Article VI of the service regulations of the International Convention.

RADIO COMPASS STATIONS NOW IN COMMISSION.

The Bureau has been advised by the Director of Naval Communications that the stations at Bar Harbor, Me., and Prices Neck, R. I., are now open for radio compass bearings. The details for these stations appear in the Radio Service Bulletin for June, 1920, No. 38.

CHANGE IN WAVE LENGTH OF CANADIAN RADIO COMPASS STATIONS.

The following report was received from the Director, Government Radio Service, Ottawa, Canada:

On and after the 1st of August, 1920, the Canadian radiotelegraph direction finding stations at Chebucto Head, Nova Scotia, Canso, Nova Scotia, and Cape Race, Newfoundland, will use the wave length of 800 meters exclusively for transmission and reception.

It will be necessary for all ships to have their transmitters adjusted to transmit on 800 meters if they desire to obtain bearings from the above stations.

All use of the wave length of 600 meters by Canadian direction finding stations will be discontinued after the 1st of August, 1920.

NEW LIST OF RADIO STATIONS OF THE UNITED STATES.

The List of Radio Stations of the United States for June 30, 1920, will be ready for distribution about October 1. This publication may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. The price of the new edition will be published in a future edition of this pamphlet.

The following notice received from London is printed for the information of radio operators and masters of vessels:

ADMIRALTY NOTICE TO MARINERS.

[No. 838 of the year 1920.]

WIRELESS DIRECTION FINDING STATIONS.

Former Notice.—No. 363 of 1920.

1. Wireless direction finding (D.F.) stations are stations set up ashore equipped with receiving apparatus which enables them to ascertain the direction from which wireless signals transmitted by another station emanate.

2. The accuracy with which bearings can be taken depends on the conditions outlined below; but, although in general the bearings taken by a station within the sector over which it is designed to work can generally be considered accurate to within two degrees, the administrations controlling these stations can not accept any responsibility for the consequences of a bearing being inaccurate.

3. It is, however, pointed out that if at least three D.F. stations can be employed and if they are so situated as to give intersecting bearings, considerable reliance can be placed upon the result of 3 simultaneous bearings thus obtained, provided that the "triangle of error" (sometimes called the "cocked hat") formed by the intersection of the bearings is small.

4. In order to obtain the greatest possible degree of accuracy, it is important that the ship should not transmit with too much power. Signals should, however, be fairly strong and clear; great care must be taken to keep the note and strength steady, and to pay strict attention to spacing.

5. It must be borne in mind that it is impossible for the majority of existing D.F. stations to distinguish between a bearing and its reciprocal (i.e., there is always a possible error of 180°), and that bearings are often unreliable at night and in very bad weather, also when the direction runs roughly parallel with the coast line.

6. The methods of asking for and giving bearings and the waves to be used will shortly be standardised by International agreement; and the particulars of the D.F. stations will eventually appear in the International List of Radiotelegraph Stations. Meanwhile, each country is publishing regulations governing the use of its own D.F. stations as set out below.

7. It should be noted that there are two principal systems of D.F. stations at present in use, viz:—

(a) Where each D.F. station is fitted with transmitting and receiving gear and works independently of others.

(b) Where several D.F. stations (all of them usually near a harbour entrance or difficult passage) are linked together by special land telegraph lines, being thus controlled by one station which alone is fitted with transmitting apparatus. The controlling station in such cases is not necessarily a D.F. station, but may be an ordinary coast station.

REGULATIONS FOR CANADIAN AND NEWFOUNDLAND D.F. STATIONS.

8. The following independent D.F. stations are established—

Station.	Call Signal.	Range (miles).	Lat. N.	Long. W.
Chebucto Head.....	VAV	250	44 30 01	63 31 20
Canso.....	VAX	100	45 19 24	60 58 25
Cape Race.....	VAZ	250	46 39 10	53 05 05

9. These stations keep watch and take bearings on the 600-metre wave.

10. A ship requiring a bearing should call the D.F. station required, and transmit a government message requesting the bearing.

Example.—A ship S.S. "Nonsuch" call sign XYZ, calls up Chebucto Head in the ordinary way and, on receiving "K" (go on), makes the message as follows—

"Call" S Radio Nonsuch 1, 5, 10 (day of month) 10.50 M (time)=Officer in charge
Chebucto Head=Request bearing=Master+XYZ

11. The D.F. station will then acknowledge receipt of the message and, if not ready to take the bearing at once, will direct the ship to wait.

12. When ready to take the bearing, the D.F. station will make "K" (go on), whereupon the ship will make the figure "2" 30 times, commencing with the "Call" and ending with the "Cross" and her own call signal.

13. If the D.F. station is not satisfied with the bearing, it will make the "repeat" sign (?) and the ship will again make the figure "2" as above, but only 20 times.

14. In default of such request for a repetition, the D.F. station does not transmit until it is ready to give the bearing. To do so, the station calls the ship and sends (as a government message) the TRUE bearing of the ship from the station in degrees from 0° to 359° , the angles being measured from true north (0°) clockwise through true east (90°), true south (180°), and true west (270°).

REGULATIONS FOR D. F. STATIONS IN THE UNITED STATES.

15. The following U. S. Naval D. F. stations are now in operation for the purpose of furnishing bearings to vessels in the Western Atlantic. Stations marked * are in continuous operation in foggy weather only.

The stations given in the former Notice, which are not included in the following list, are to be expunged from the charts.

Station.	Call Signal.	Latitude, N.			Longitude, W.		
		°	'	"	°	'	"
Bar Harbor, Me.	NBD	44	18	36	68	11	27
Gloucester, Mass.	NAD	42	35	19	70	41	08
*Deer Island, Mass.	NAD	42	21	15	70	57	30
Surfside, Nantucket, Mass.	NBS	41	14	42	70	05	56
Montauk, Long Island, N. Y.	NAH	41	03	09	71	57	27
Fire Island, N. Y.	NAH	40	38	07	73	12	32
Sandy Hook, N. J.	NAH	40	28	12	74	01	06
Mantoloking, N. J.	NAH	40	01	30	74	03	10
Cape May, N. J.	NSD	38	56	41	74	53	10
Bethany Beach, Del.	NSD	38	32	45	75	03	21
Hog Island, Va.	NCZ	37	22	36	75	42	37
Cape Henry, Va.	NCZ	36	55	16	75	59	51
Cape Hatteras, N. C.	NDW	35	14	22	75	31	42
Cape Lookout, N. C.	NAN	34	36	13	76	32	15
North Island, N. C.	NZW	33	13	21	79	11	06
*Morris Island, S. C.	NAO	32	41	36	79	53	17

16. Where two or more of the foregoing D. F. stations have the same call signal it indicates that they are connected by telegraph to and under the control of a central control station, the call signal being the call of the central control station. When a request for bearings is made the central control station invariably answers with a bearing from each of the D. F. stations under its control.

17. The following signals have been authorized and will be used until further notice:

Signal.	Meaning.
---------	----------

QTE?.....What is my true bearing?

QTE.....Your true bearing is — degrees from — D. F. station.

18. To obtain bearings, the D. F. station should be called on 800 metres in the usual manner, and the call followed by the signal "QTE?", meaning "What is my true bearing?" When told by the D. F. station to "K" (go ahead), the ship's operator should follow the procedure outlined below:

(a) Transmit the ship's call signal for 30 seconds.

(b) Make dashes, each dash 5 seconds long, for one minute, with the ship's call signal after each dash.

(c) Terminate with the signal "K" (go ahead).

19. If satisfactory bearings are obtained, the operator at the D.F. station will call the vessel in the usual manner and reply "QTE" followed by the true bearing in degrees (0 to 359) spelled out in words, and the name of the D.F. station from which the bearing was obtained; otherwise a repetition of the test will be requested.

20. The ship's operator should acknowledge receipt of the bearings by answering the D.F. station in the usual manner and repeat, in numerals, the bearings received. This procedure enables all stations concerned to check the bearings.

21. All United States Naval D.F. stations keep watch and transmit on 800 metres for merchant vessels, and this wave-length should be used for calling and answering and carrying on all communication with these stations.

22. In order that the operation of shore D.F. stations may be checked up, a brief report should be forwarded to the Director Naval Communications, Navy Department, Washington, D. C., containing:

(a) Name of ship.

(b) Name of D.F. station.

(c) Date and G.M.T. at which wireless bearing was given.

(d) Bearing given by D.F. station.

(e) Estimated position of ship at above time and date by methods other than wireless.

(f) The probable degree of accuracy of the estimated position.

(g) Weather conditions at above time.

(h) Remarks, if any.

(i) Signature of master or responsible navigating officer.

REGULATIONS FOR D.F. STATIONS IN THE UNITED KINGDOM.

23. The following D.F. stations are established:

Station.	Call Signal.	Lat. N.	Long. W.
Peterhead.....	BVL	57 33 30	1 49 05
Berwick.....	BVG	55 41 48	1 53 40
Flamborough.....	BVN	54 07 05	0 04 58
Amlwch ²	BXV	53 24 28	4 18 20
Rhyl ¹	BZW	53 18 20	3 28 50
Lizard.....	BVY	49 50 07	5 12 18
Carnsore.....	BVZ	52 11 50	6 21 00
Larne.....	BXJ	54 51 15	5 48 15
Seaview ¹	BXK	55 22 00	7 19 25

NOTES:

¹ Rhyl is not fitted with transmitting apparatus and is controlled by Amlwch.

² Seaview is not fitted with transmitting apparatus and is controlled by Malin Head (GMH), which keeps watch on 600 metres.

24. All the above D. F. stations keep watch *and take bearings* on the 450 metres wave (*see note*). Except as shown in the notes they all work as independent stations and can transmit, as well as receive, on 450 metres.

Note.—Ships with Marconi apparatus can adjust their transmitting gear very nearly to this wave (using reduced power) by cutting out half the primary transmitting condenser and adjusting the A. T. I. till the earth lamp shows maximum current in the aerial. The primary slider should be “all in.”

25. The actual procedure to be adopted by ships requiring bearings will depend upon what stations are concerned. It should be observed that if the stations to be called do not all keep watch on the same wave (*e. g.*, Malin Head and Larne), bearings should be asked for separately. If on the other hand the stations to be called all keep watch on the same wave (*e. g.*, Lizard and Carnsore), they should be called up together and the bearings taken in one operation. If, however, two or more stations are linked by special land lines (*e. g.*, Amlwch and Rhyl), only one of them should be called up. In such cases, however, the ship must specify in the preliminary signal the D. F. stations which are required to supply bearings.

26. The following abbreviations are to be used:—

Signal.	Meaning.
QTE? ...	“What is my true bearing from you (or from —)?”
QTE	“Your true bearing from me (or from —) was — degrees.”

27. The ship calls the station or stations on the appropriate wave, making “QTE?” in conjunction, if necessary, with the call signals of the stations from which bearings are required and also (if the call is not made on 450 metres) by the figures “450,” signifying that the ship will shift to 450 metres for the taking of the bearing. The ship then awaits instructions.

Example 1.

A ship whose call signal is XYZ requires bearings from Amlwch (BXV) and Rhyl (BZW).

The ship, having first shifted to 450 metres, calls Amlwch thus:—

CT BXV BXV de XYZ QTE BXV BZW?

She then awaits instructions.

Example 2.

The ship requires a bearing from Seaview (BXK). The ship has to use 600 metres to call Malin Head (GMH).

She calls on 600 metres, thus:—

CT GMH GMH de XYZ QTE BXK? 450.

She then gets ready to shift to 450 metres and awaits instructions.

28. The station or stations called then make the necessary arrangements and, when ready, answer in alphabetical order of their call signals (if more than one was originally called) and make “K” (go on) preceded by “450” if 450 had been made in the original call.

Example 1.

Amlwch, in Example 1 above, warns Rhyl by land line and, when both are ready, makes on 450 metres:—

CT XYZ de BXV K

Example 2.

Malin Head, in Example 2 above, warns Seaview by land line and then makes on 600 metres:—

CT XYZ de GMH 450 K

Malin Head then shifts to 450 metres so as to be ready to give the result when received by wire from Seaview.

29. On receiving "K," the ship, having shifted transmitting wave to 450 metres (if not already done), then makes her own call signal for 45 seconds and awaits the result.

Example 1.

The ship, in Example 1 above, makes on 450 metres:—

CT BXV de XYZ XYZ XYZ, &c. (for 45 seconds) XYZ

Example 2.

The same as Example 1, reading GMH for BXV.

30. The station or stations then reply (in alphabetical order if more than one) either asking the ship to repeat (?) or giving the result. The result is given by the signal QTE followed as necessary by the call signal and by a group of *three* figures (000 to 359) indicating the true bearing from 0° to 359°, reckoned as in paragraph 14. of the ship *from* the station. Several bearings can be combined into one message, each bearing immediately following the call signal of the station which took it. The time of handing in is always expressed in Greenwich mean time for all messages giving bearings to merchant ships.

Example 1.

Rhyl, in Example 1 above, is not satisfied with the bearing and informs Amlwch. Amlwch makes on 450 metres:—

CT XYZ de BXV?

The ship at once complies by making on 450 meters:—

CT BXV de XYZ XYZ XYZ, &c. (for 45 seconds) XYZ

Rhyl is then satisfied that the bearing is 340° and informs Amlwch, while Amlwch finds that its own result is 37°. Amlwch therefore makes on 450 metres:—

CT XYZ XYZ de BXV 1 9.45 M (time)=QTE BZW 340 BXV 037+BXV

Example 2.

Seaview, in Example 2 above, gets a satisfactory bearing of 329° and informs Malin Head. The latter makes on 450 metres:—

CT XYZ XYZ de GMH 2 10.46 S (time)=QTE BXK 329+GMH

Example 3.

Had the ship merely asked Lizard (BVY) for a bearing, Lizard, finding it to be 246°, would make on 450 meters:—

CT XYZ XYZ de BVY 1 7.6 M (time)=QTE 246+BVY

31. The ship, on receiving the result, acknowledges receipt in the ordinary way, and makes the "end of work" sign. This sign is then repeated by the station or stations concerned. It is important that the "end of work" sign should not be omitted since it not only indicates that the operation is finished, but it also shows that all concerned are about to resume watch on their normal wave.

REGULATIONS FOR FRENCH D. F. STATIONS.

32. The following D. F. stations are established:—

Station.	Call Signal.	Lat. N.			Long.		
		°	'	"	°	'	"
Le Havre.....	FFU	49	31	30	0	07	00 E.
Bernières.....	UHN	49	20	00	0	25	00 W.
Cherbourg.....	FFC	49	36	32	1	36	00 W.
Tréguier.....	FQC	48	50	08	3	13	56 W.
Ouessant—Pen ar Roch ¹	FHY	48	26	27	5	05	33 W.
Brest—Guipavas.....	FHA	48	27	00	4	26	30 W.
Brest—Capucins ²	HUD	48	19	12	4	34	48 W.
Pointe du Raz.....	FPU	48	02	22	4	43	52 W.
Lorient.....	FFL	47	44	05	3	20	45 W.
Chémoulin ³	FUH	47	14	06	2	17	54 W.
Rochefort—Soubise.....	HOB	45	56	00	1	00	00 W.
Barre de l'Adour.....	FLO	43	31	40	1	31	20 W.
Casablanca—Chetaba ³	FCH	33	35	21	7	34	10 W.

NOTES.—*Chémoulin closed pending transfer to Ville-ès-Martin, near St. Nazaire, of which further notice will be given. Chémoulin station is to be expunged from the charts.

¹ Ouessant—Pen ar Roch answers FFF.

² Brest—Capucins answers FFK.

³ Casablanca—Chetaba answers CNP.

33. The regulations for French D. F. stations are similar to those for the United Kingdom.

REGULATIONS FOR ITALIAN D. F. STATIONS.

34. The following D. F. station is established:—

Station.	Call Signal.	Lat. N.			Long. E.		
		°	'	"	°	'	"
Murano.....	IRM	45	27	40	12	21	22

NOTE.—The above station cannot answer the calls from ships, but is in direct communication by telegraph with the W/T station Carbonera (ICZ).

35. Vessels wishing to obtain bearings from Murano D.F. station must call up Carbonera station, and the latter, having obtained the required information from Murano, will duly transmit it to them. The bearings are True, and are given in degrees from 0° to 359°.

36. The procedure is as follows:—

A ship whose call signal is ABC wishes a bearing.

On a wave of 600 metres she will signal:—

$\overline{CT}$ ICZ ICZ de ABC QTE ?

Carbonera will answer:—

$\overline{CT}$ ABC de ICZ $\overline{AS}$

Carbonera then wires Murano; when ready, Carbonera replies:

$\overline{CT}$ ABC de ICZ K 6

ABC after 30 seconds signals:—

$\overline{CT}$ ICZ de ABC ABC ABC &c., for 45 seconds.

37. If dissatisfied with the bearing, Murano through Carbonera will ask the ship to repeat.

Carbonera signals:—

$\overline{CT}$ ABC de ICZ $\overline{UD}$

ABC repeats the signal as given above.

38. When satisfied with the bearing, which is assumed to be 170°, at 9.45, Murano will transmit it by telegraph to Carbonera, whence it is passed to the ship as follows:—

CT ABC de ICZ de IRM 9.45 M BT QTE 170 AR ICZ

ABC acknowledges receipt:—

CT ICZ de ABC R SK

REGULATIONS FOR GERMAN D.F. STATIONS.

39. The following D.F. stations on the German North Sea Coast are established. The stations belong to the State Marine but are also available for public use:—

Station.	Call Signal.	Lat. N.	Long. E.
*Wilhelmshaven.....	KAN	53 31 00	8 09 30
List.....	VBD	53 00 12	8 53 12
Nordholz.....	MNF	53 47 06	8 38 30
Borkum.....	FNR	53 34 55	6 40 54

* Control station.

40. (a)—A ship (call sign ABC) requiring a bearing from each of the three stations, the following procedure is to be employed:—

CT	KAN	KAN	KAN	DE	ABC	AR	
CT	ABC	ABC	ABC	DE	KAN	AR	K
CT	KAN	DE	ABC	BT	QTE	AR	
CT	ABC	DE	KAN	VE	AS		
CT	FNR	FNR	FNR	MNF	MNF	MNF	
	VBD	VBD	VBD	DE	KAN	BT	PEILUNG (Bearing)
	600 m — WELLE			ABC			
	(metre wave)						
CT	ABC	DE	KAN	BT	BITTE VV	GEBEN	AR
					(Please send V's)		
CT	KAN	DE	ABC	BT	V's	ABC	AR
CT	FNR	MNF	VBD	DE	KAN	AR	K
CT	KAN	DE	FNR	BT	PEILUNG	ABC . . .	GRAD (Degrees)
	FNR	1018	AR				
Similarly MNF and VBD pass their bearings to KAN							
CT	FNR	MNF	VBD	DE	KAN	VE	
CT	ABC	DE	KAN	BT	PEILUNG	1018 ?	AR K
					(Have you received Bearing)		
CT	KAN	DE	ABC	VE	VE	AR	SK
CT	ABC	DE	KAN	VE	SK		
CT	FNR	MNF	VBD	DE	KAN	SK	

(b)—A ship (call sign ABC) requiring her position to be obtained by means of bearings from the three stations, the following procedure is to be employed:—

With the exception that QTF is substituted for QTE the procedure is as in (a) above until the three stations have passed the bearings to KAN.

KAN then makes to ABC:—

CT	ABC	DE	KAN	BT	IHR	STANDORT	NACH	FUNK
						(your position by means of		
PEILUNG	UM	1018	IST	—	GRAD	—	MIN	—
bearings	at		is		degrees		minutes	seconds
						—	SEK	NORD-
BREITE	—	GRAD	—	MIN	—	SEK	OST-LÄNGE	AR K
						degrees	minutes	seconds
						east)		

The procedure is then as in the last 3 lines of (a) above.

41. **NOTE.**—Mid-European time is used, the hours and minutes being expressed in four figures from 0000 to 2359.

Note.—This Notice is a revision of the former Notice quoted above.

Admiralty, London.
22nd May 1920.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, September 1, 1920—No. 41

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of Aug. 15, 1919) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Dearborn, Mich.....	KDEN	{ 300, 460, 480, 530, 520, 600 300, 500, 600 }	PR	X	Henry Ford.
Northville, Mich.....	KDEP		PR	X	Do.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		<i>Cents.</i>	<i>Cents.</i>				
Algic.....	KDDC	4	4	PG	X	U. S. Shipping Board.	
Atlanta of Texas.....	KDCN	4	4	PG	X	do.	
Bayside.....	KDDX	4	4	PG	X	do.	
Bayspring.....	KDDW	4	4	PG	X	do.	
Carenco.....	KDDM	4	4	PG	X	do.	
Carlton.....	KDDK	4	4	PG	X	do.	
Carplake.....	KDES	4	4	PG	X	do.	
Carrabelle.....	KDER	4	4	PG	X	do.	
Cassimir.....	KDDZ	4	4	PG	X	do.	
Cody.....	KDEX	4	4	PG	X	do.	
Culberson.....	KDDV	4	4	PG	X	do.	
Delivery No. 5.....	KDCK			PG	X	Standard Oil Co. of N. Y.	
Derblay.....	KDDT	4	4	PG	X	U. S. Shipping Board.	
Eastern Soldier.....	KDED	4	4	PG	X	do.	
Egeria.....	KDCJ			PG	X	Coast Shipbuilding Co.	
Elmac.....	KDCY			PG	X	Saginaw Shipbuilding Co.	
Geo. L. Harvey.....	KDET			PG			
George Washington.....	KDCL	4	4	PG	N	U. S. Shipping Board.	
Gladysbe.....	KDEV			PG	N	U. S. Mex. Oil Corp.	
Golden State.....	KDCM	4	4	PG	X	U. S. Shipping Board.	
Gulfstar.....	KDEB	4	8	PG	X	Gulf Refining Co.	
Halo.....	KDCP	4	4	PG	X	U. S. Shipping Board.	
Halsey.....	KDDR	4	4	PG	X	do.	
Hastings.....	KDDL	4	4	PG	X	do.	
Haynie.....	KDCR	4	4	PG	X	do.	S. O. R. S.
Heber.....	KDDU	4	4	PG	X	do.	
Hera.....	KDGA	4	4	PG	X	do.	
Hoboken.....	KDEQ						
Hollywood.....	KDCS	4	4	PG	X	U. S. Shipping Board.	
Houston.....	KDCO	4	4	PG	X	do.	
I. C. White.....	KDDB			PG	X	Pan-American Petroleum & Transport Co.	
Jalapa.....	KDCW	4	4	PG	X	U. S. Shipping Board.	
John Englis.....	KDDJ	4	4	PG	X	do.	
Loki.....	KDGD	4	4	PG	X	do.	
Lorraine Cross.....	KDDE	4	4	PG	X	do.	
Mevania.....	KDCU	4	4	PG	X	do.	R. C. of A.
Mosella.....	KDCQ	4	4	PG	X	do.	Do.
Mount Vernon.....	KDCZ	4	4	PG	X	do.	
Niobe.....	KDGB	4	4	PG	X	do.	
Palo Alto.....	KDCT	4	4	PG	X	do.	
Pawnee.....	KDGC	4	4	PG	X	do.	
Philip Publicker.....	KDEW						

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—continued.

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
Red Hook.....	KDDA	Cents. 4	Cents. 4	PG	X	U. S. Shipping Board.	Owner of vessel.
Reginolite.....	KDEM			PG	X	Humble Oil & Refining Co.	
Santa Eulalia.....	KDDY			PG	X	American & Cuba S. S. Line.	
Sialia.....	WFY	8	8	PG	X	Henry Ford.....	
Steel Engineer.....	KDCX			PG	N	U. S. Steel Products Co.	
Steel Exporter.....	KDDN			PG	N	do.....	
Stockton.....	KDDS	4	4	PG	X	do.....	
Suduffco.....	KDDO			PG	X	Submarine Boat Corp.	
Sudurco.....	KDEY			PG	X	do.....	
Sumanco.....	KDDH			PG	X	do.....	
Surico.....	KDDP			PG	X	do.....	
Susherico.....	KDDQ			PG	X	do.....	
Sutermco.....	KDDI			PG	X	do.....	
Syros.....	KDEC	4	4	PG	X	U. S. Shipping Board.	
Theodore F. Reynolds	KDDG			PG	X	McDougal-Duluth S. B. Co.	
West Canon.....	KDCV	4	4	PG	X	U. S. Shipping Board.	
Wotan.....	KDGE	4	4	PG	X	do.....	
Yaka.....	KDDF	4	4	PG	X	do.....	

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDCJ	Egeria.....b	KDDP	Surico.....b
KDCK	Delivery No. 5.....b	KDDQ	Susherico.....b
KDCL	George Washington.....b	KDDR	Halsey.....b
KDCM	Golden State.....b	KDDS	Stockton.....b
KDCN	Atlanta of Texas.....b	KDDT	Derblay.....b
KDCO	Houston.....b	KDDU	Heber.....b
KDCP	Halo.....b	KDDV	Culberson.....b
KDCQ	Mosella.....b	KDDW	Bayspring.....b
KDCR	Haynie.....b	KDDX	Bayside.....b
KDCS	Hollywood.....b	KDDY	Santa Eulalia.....b
KDCT	Palo Alto.....b	KDDZ	Cassimir.....b
KDCU	Mevania.....b	KDEB	Gulfstar.....b
KDCV	West Canon.....b	KDEC	Syros.....b
KDCW	Jalapa.....b	KDED	Eastern Soldier.....b
KDCX	Steel Engineer.....b	KDEM	Reginolite.....b
KDCY	Elmac.....b	KDEN	Dearborn, Mich.....c
KDCZ	Mount Vernon.....b	KDEP	Northville, Mich.....c
KDDA	Red Hook.....b	KDEQ	Hoboken.....b
Kddb	I. C. White.....b	KDER	Carrabulle.....b
KDDC	Algic.....b	KDES	Carplake.....b
KDDE	Lorraine Cross.....b	KDET	Geo. L. Harvey.....b
KDDF	Yaka.....b	KDEV	Gladysbe.....b
KDDG	Theodore F. Reynolds.....b	KDEW	Philip Publicker.....b
KDDH	Sumanco.....b	KDEX	Cody.....b
KDDI	Sutermco.....b	KDEY	Sudurco.....b
KDDJ	John Englis.....b	KDGA	Hera.....b
KDDK	Carlton.....b	KDGB	Niobe.....b
KDDL	Hastings.....b	KDGC	Pawnee.....b
KDDM	Carenco.....b	KDGD	Loki.....b
KDDN	Steel Exporter.....b	KDGE	Wotan.....b
KDDO	Suduffco.....b	WFY	Sialia.....b

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Cheyenne, Wyo.	KDEG	Post Office Department.
Elko, Nev.	KDEJ	Do.
Omaha, Nebr.	KDEF	Do.
Reno, Nev.	KDEK	Do.
Salt Lake, Utah.	KDEH	Do.
St. Louis, Mo.	KDEL	Do.

NOTE.—All of the above are air mail stations.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Sumner.	NUQX		

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
KDEF	Omaha, Nebr. ....c	KDEK	Reno, Nev. ....c
KDEG	Cheyenne, Wyo. ....c	KDEL	St. Louis, Mo. ....c
KDEH	Salt Lake, Utah. ....c	NUQX	Sumner. ....b
KDEJ	Elko, Nev. ....c		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, only.]

Station.	Call signal.	Station controlled by—
Belfast, Me.	IXR	International Radio Telegraph Co.
Boston, Mass.	IYS	Massachusetts Radio and Training School.
Chicago, Ill.	9YL	Armour Institute of Technology.
Cleveland, Ohio.	8XC	Glenn L. Martin Co.
Culver, Ind.	9YQ	Culver Military Academy.
Detroit, Mich.	8YE	Cass Technical High School.
New Orleans, La.	5YJ	Knights of Columbus.
Philadelphia, Pa.	3YF	Pennsylvania-Marconi Wireless School.
Rockland, Me.	1XQ	International Radio Telegraph Co.
St. Louis, Mo.	9YK	St. Louis University.
Yonkers, N. Y.	2XO	Walter G. Hudson.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XQ	First district:		
1XR	Rockland, Me.	5YJ	Fifth district:
1YS	Belfast, Me.		New Orleans, La.
	Boston, Mass.	8XC	Eighth district:
2XO	Second district:	8YE	Cleveland, Ohio.
	Yonkers, N. Y.		Detroit, Mich.
3YF	Third district:	9YK	Ninth district:
	Philadelphia, Pa.	9YL	St. Louis, Mo.
		9YQ	Chicago, Ill.
			Culver, Ind.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name** = Name of station.
G. loc. = Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call = Call letters assigned.
System = Radio system used and sparks per second.
Range = Normal range in nautical miles.
W. L. = Wave lengths assigned: Normal wave lengths in italics.
Service = Nature of service maintained:
 PG=General public
 PR=Limited public.
 P =Private.
 O =Government business exclusively.
Hours =Hours of operation:
 N =Continuous service.
 X =No regular hours.
 m =a. m. (12m=midday).
 s =p. m. (12s=midnight).
Rates =Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
I. W. T. Co. =Independent Wireless Telegraph Co.
R. C. of A. =Radio Corporation of America.
S. O. R. S. =Ship Owners Radio Service.
Co. =Company.
Corpn. =Corporation.
& =And.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ROCKLAND, ME.—Service, PR; hours, X.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ANTINOUS.—Green Star S. S. Corporation, owner of vessel; station operated and controlled by I. W. T. Co.

ARGUS.—Green Star S. S. Corporation, owner of vessel.

BOOBYALLA.—Pacific Motorship Co., owner of vessel.

OMUS.—Station operated and controlled by owner of vessel.

FOREST KING.—A Schubach, owner of vessel.

GLENDOLA.—Glendola S. S. Corporation, owner of vessel.
GLORIETA.—Name changed to Munisla.
MOCCASIN.—Name changed to Porto Rico.
PHYLLIS.—W. R. Chamberlin owner of vessel.
REDONDO (KYT).—Station operated and controlled by owner of vessel.
SIBONEY.—New York & Cuba Mail S. S. Co. owner of vessel.
SUSQUEHANNA (WEM).—Station operated and controlled by owner of vessel.
WEST CAVANAL.—Imperial Shipping Corporation owner of vessel.
WEST IRMO.—Imperial Shipping Corporation owner of vessel.
W. K. BIXBY.—Name changed to J. L. Reiss.
WOUDRICHEM.—Kennebec S. S. Corporation owner of vessel.

**THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED
AND CONTROLLED BY THE SHIP OWNERS RADIO SERVICE (INC.).**

Alamosa.	Pulaski.	Lake Slavi.
City of Fort Worth.	Lake Ikatan.	Tolosa.
Eastern Exporter.	Lake Rushville.	Union Liberty.
Hoxie.		

**THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED
AND CONTROLLED BY THE RADIO CORPORATION OF AMERICA.**

Cecil County.	Jolee.	Lake Hector.
Chester Kiwanis.	Lake Flournoy.	Rotarian.
Hahira.	Lake Getaway.	Sapulpa.
Haymon.	Lake Giddings.	West Kedron.
James Otis.		

**THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND
CONTROLLED BY THE INDEPENDENT WIRELESS TELEGRAPH CO.**

Agwimoon.	Lake Fandon.	Salaam.
Anna E. Morse.	Lake Furnas.	Santa Rita.
Depere.	Lake Inglenook.	Sebonac.
Honnedaga.	Mattole.	West Holbrook.
Lake Fairport.	Nansemond.	West Notus.
Lake Fandango.		

Strike out all particulars of the following-named vessels:

Aurora.	Jason.	Providencia.
Belgrade.	Lake Frecks.	Quapaw.
Bonifay.	Lakeland.	Rochellie.
Boonsborough.	Margaret.	Shelter Island.
Boreta.	Namecki.	Snug Harbor.
Congaree.	Okesa.	Tankerville.
Darrah.	Oran.	West Aleta.
Guilford.		

**COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL
SIGNALS.**

KJO, *read* Munisla; KURJ, *read* J. L. Reiss; and WJG, *read* Porto Rico. Strike out all particulars following the call signals KBOU, KDCC, KELL, KEMF, KENT, KETC, KIQQ, KNJ, KOKB, KPOO, KUNX, WBAA, WFAA, WIK, WJAU, WQK, WROU, WRQ, WVEA, WXEE, WXUE, and WZIA.

**GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF
STATIONS.**

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920.]

CROSS ISLAND, ME.—Strike out all particulars.
FORT STEVENS, OREG.—Call letters changed, NPE.
MANATI, CUBA.—Strike out all particulars.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920.]

H-1.—Strike out all particulars.

MOUNT VERNON.—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NPE, read Fort Stevens, Oreg. Strike out all particulars following the call signals **NFL**, **NMB**, **NYC**, and **WUAA**.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

DEARBORN, MICH. (8XD).—Strike out all particulars.

NORTHVILLE, MICH. (8XL).—Strike out all particulars.

MISCELLANEOUS.

IMPROPER USE OF STORAGE BATTERY.

It has been brought to the attention of the Bureau that operators have been using auxiliary source of power (storage battery), for the operation of audions.

The auxiliary source of power must not be used for any purpose other than that required by section 1, act of June 24, 1910, amended July 23, 1912.

The battery must be kept fully charged and ready for immediate use.

Any defects in the battery or any other part of the radio equipment should be reported to the master of the vessel immediately.

Such neglect of duty on the part of operators may be considered sufficient cause for the suspension or revocation of their license.

INTERNATIONAL RADIO TELEGRAPH CO'S. RATES.

The International Radio Telegraph Co. has been authorized to charge **10 cents** per word (with no minimum number of words), for transoceanic and coastwise ships which ply between ports, one of which is more than 200 miles from New York, effective October 1, 1920. This rate applies to the Newport, R. I., New London, Conn., and Brooklyn, N. Y., stations of the above-named company.

NEW INTERNATIONAL ABBREVIATIONS.

This office is informed by the Berne Bureau as follows:

Abbreviation.	Question.	Response or advice.
QTC...	Have you anything to transmit	I have something to transmit. I have one or more radiograms for —.

New signification of abbreviation QRU.

QRU.		I have nothing to transmit. I have nothing for you.
------	-------	--

OPERATOR'S LICENSE SUSPENDED.

License No. 19544, issued at Philadelphia, September 20, 1919, has been suspended for a period of three months on account of the holder of the license violating Article VI of the service regulations and the International Convention. The offending operator in this case caused superfluous signals to be transmitted.

NORMAL WAVE LENGTH.

Every coast station open to general public service is required to have a normal sending and receiving wave length of 600 meters, and all general public service with ship stations must be conducted on 300, 600, or 1,800 meters.

The department interprets the radio laws and the London Convention to require that every coast station, excepting general and restricted amateur, shall have a normal wave length of 600 meters for use in case of distress or emergency, and licenses issued for such stations so indicate.

The indication of a 600-meter normal wave length for a special station does not mean that the station shall use this wave length for its *normal* business. All radio communication, other than general public service, must be conducted on some authorized wave length other than 300, 600, or 1,800 meters, but the station is required, when open and no special business is being conducted, to listen in with the receiving apparatus tuned to receive the 600-meter wave length and must be prepared to transmit on 600 meters if necessary. The Radio Laws and Regulations, edition of August 15, 1919, page 52, paragraphs 38 to 50, inclusive, bear on this subject, and paragraph 44 provides that all coast stations shall listen in at intervals of not more than 15 minutes and for not less than 2 minutes, with the receiving apparatus adjusted to receive a 600-meter wave length. The act of August 13, 1912, section 4, regulation 11, requires general public-service coast stations to listen in at intervals of not less than 15 minutes and for a period of not less than 2 minutes with the receiver tuned to receive messages of 300-meter wave lengths.

INDEPENDENT WIRELESS TELEGRAPH CO.'S RATES.

The Independent Wireless Telegraph Co. has been authorized to charge 10 cents per word, no minimum, at their New York station (WSE) for coastwise and transoceanic ships. This rate effective beginning October 1, 1920.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, December 1, 1920—No. 44

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DEPARTMENT OF COMMERCE.

BUREAU OF NAVIGATION,

Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of Aug. 15, 1919) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
East Hampton, N.Y.	WSA....	300,450,515,600	PG	N	Cutting & Washington Radio Corp.

¹ Loc., 0 72° 12' 33"; N. 40° 57' 28"; system, Cutting & Washington, 1000; range, 300; rates, 10¢ per word for ship service.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
Algonquin ¹	KDKH.	Cents. 4	Cents. 4	PG	X	Standard Transportation Co.	R. C. of A.
A. L. Kent.....	KDLL.			PG	X	Crowell & Thurlow S. S. Co.	
Antonio.....	KDKI.			PG	X	McDougall-Duluth Shipbuilding Co.	
Artemis.....	KDLJ.				X	J. M. Scott.....	Owner of vessel.
Blue Point.....	KDLU.				X	Atlantic Fisheries Co.	
Camden.....	KDKL.	8	8	PG	X	Atlantic Fruit Co.	T. R. T. Co.
Charlie Watson.....	KDLA.			PG	X	Standard Oil Co.	
Chaumont.....	KDLI.	4	4	PG	N	U. S. Shipping Board.	
Cuba.....	KDLK.			PG	N	John T. Phillips.....	Cutting & Washington Radio Corp.
Dan F. Hanlon.....	KDKU.			PG	X	D. J. Hanlon.....	
Dinsmore.....	KDKN.	4	4	PG	X	U. S. Shipping Board.	
El Estero.....	KDKT.			PG	X	Southern Pacific Co.	
Franklin K. Lane.....	KDLH.			PG	X	Pan-American Petroleum & Transport Co.	
George Pierce.....	KDLT.	4	4	PG	X	U. S. Shipping Board.	
Henry S. Grove.....	KDLN.	4	4	PG	X	do.	
Herman Frasch.....	KDLW.			PG	X	Union Sulphur Co.	
Josefa.....	KDKJ.			PG	X	McDougall-Duluth Shipbuilding Co.	
Lake Gatun.....	KDKP.			PG	X	Saginaw Shipbuilding Co.	
Maracay.....	KDKO.					Caribbean Trading Co.	
Marne.....	KDLV.	4	4	PG	N	U. S. Shipping Board.	
Mary Luckenbach.....	KDLX.			PG	X	Luckenbach Terminals	
Minnekahda.....	KDKK.			PG	N	Atlantic Transport Co.	I. W. T. Co.
Natrar.....	KDKM.	4	4	PG	X	U. S. Shipping Board.	
Peacock.....	KDKY.	4	4	PG	X	do.	
Peardon.....	KDLC.			PG	X	U. S.-Mex. Oil Corp.	
Reaper.....	KDLG.			PG	X	Texas S. S. Co.	
Retriever.....	KDKR.	4	4	PG	X	U. S. Shipping Board.	
Rodman Swift ²	KDKQ.			PR	X	Submarine Signal Co.	Owner of vessel.
Salvor.....	KDKS.	4	4	PG	X	U. S. Shipping Board.	
Somme.....	KDKZ.	4	4	PG	N	do.	
Sugillenco.....	KDLS.			PG	X	Submarine Boat Corp.	
Sujameco.....	KDLF.			PG	X	do.	
Suvarinco.....	KDLI.			PG	X	do.	
Suwordenco.....	KDLE.			PG	X	do.	
Tuscaloosa City.....	KDLO.			PG	N	U. S. Steel Products Co.	
Wacosta.....	KDLM.	4	4	PG	X	U. S. Shipping Board.	
W. J. Hanna.....	KDKX.			PG	X	Standard Oil Co.	

¹ Range, 300; system, Marconi, 1000; w. l., 300,450,600.

² Range, 50; system, composite; w. l., 200,300,600.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; c—land station.]

Call signal.	Name.	Call signal.	Name.
KDKH	Algonquin.....b	KDLB	Suwarinco.....b
KDKI	Antonio.....b	KDLE	Suwordenco.....b
KDKJ	Josefa.....b	KDLF	Sujameco.....b
KDKK	Minnehahda.....b	KDLG	Reaper.....b
KDKL	Camden.....b	KDLH	Franklin K. Lane.....b
KDKM	Natirar.....b	KDLI	Chaumont.....b
KDKN	Dinsmore.....b	KDLJ	Artemis.....b
KDKO	Maracay.....b	KDLK	Cuba.....b
KDKP	Lake Gatun.....b	KDLL	A. L. Kent.....b
KDKQ	Rodman Swift.....b	KDLM	Wacosta.....b
KDKR	Retriever.....b	KDLN	Henry S. Grove.....b
KDKS	Salvor.....b	KDLO	Tuscaloosa City.....b
KDKT	El Estero.....b	KDLS	Sugillenco.....b
KDKU	Dan F. Hanlon.....b	KDLT	George Pierce.....b
KDKW	Argonne.....b	KDLU	Blue Point.....b
KDKX	W. J. Hanna.....b	KDLV	Marne.....b
KDKY	Peacock.....b	KDLW	Herman Frasch.....b
KDKZ	Somme.....b	KDLX	Mary Luckenbach.....b
KDLA	Charlie Watson.....b		
KDLB	Creole State.....b	WSA	East Hampton, N. Y.....c
KDLC	Pearldon.....b		

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Boston, Mass.....	WXH	U. S. Signal Corps.
Cullon, P. I.....	KDLQ	Philippine Insular Government.
Malita, P. I.....	KDLP	Do.
San Francisco, P. I.....	KDLR	Do.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Amaranth.....	NAPT	Fahrenheit.....	NECK

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; c—land station.]

Call signal.	Name of station.	Call signal.	Name of station.
KDLP	Malita, P. I.....c	NAPT	Amaranth.....b
KDLQ	Cullon, P. I.....c	NECK	Fahrenheit.....b
KDLR	San Francisco, P. I.....c	WXH	Boston, Mass.....c

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, only.]

Station.	Call signal.	Station controlled by—
Baltimore, Md.	3YH	Young Men's Christian Association Radio School.
Detroit, Mich.	8YJ	George W. Carter.
Dubuque, Iowa.	9ZB	Clifford W. Patch.
East Lansing, Mich.	8YG	Michigan Agricultural College.
Highland Park, Mich.	8ZZ	Clyde E. Darr.
Lansing, Mich.	8XS	Wilcox Laboratories.
Mansfield, Mich.	8ZR	Radio Club of Mansfield.
Morgantown, W. Va.	8YH	West Virginia University.
Oxford, Ohio.	8YR	Miami University.
Salt Lake City, Utah.	6ZM	The Deseret News.
Schenectady, N. Y.	2XI	General Electric Co.
St. Marys, Ohio.	8ZL	Charles Candler.
Vancouver, Wash.	7ZK	Vernon J. Bird.
West Lafayette, Ind.	9YB	Purdue University.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
2XI	Second district: Schenectady, N. Y.	8YH	Eighth district—Continued.
3YH	Third district: Baltimore, Md.	8YJ	Morgantown, W. Va.
6ZM	Sixth district: Salt Lake City, Utah.	8YR	Detroit, Mich.
7ZK	Seventh district: Vancouver, Wash.	8ZL	Oxford, Ohio.
8XS	Eighth district: Lansing, Mich.	8ZR	St. Marys, Ohio.
8YG	East Lansing, Mich.	8ZZ	Mansfield, Mich.
		9YB	Highland Park, Mich.
		9ZB	Ninth district: West Lafayette, Ind.
			Dubuque, Iowa.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name =Name of station.
 G. loc. =Geographical location: O=west longitude, N=north latitude, S=south latitude.
 Call =Call letters assigned.
 System =Radio system used and sparks per second.
 Range =Normal range in nautical miles.
 W. L. =Wave lengths assigned: Normal wave lengths in italics.
 Service =Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P =Private.
 O =Government business exclusively.
 Hours =Hours of operation:
 N =Continuous service.
 X =No regular hours.
 m =a. m. (12m=midday).
 s =p. m. (12s=midnight).
 Rates =Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
 I. W. T. Co.=Independent Wireless Telegraph Co.
 R. C. of A. =Radio Corporation of America.
 S. O. R. S. =Ship Owners Radio Service.
 Co. =Company.
 Corp. =Corporation.
 & =And.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATION.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berns bureau.]

TUCKERTON, N. J.—W. l., 300, 600, 8000; service, PR.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAME OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berns bureau.]

AGYLLA.—W. l., 300, 450, 600.

AMERICAN STAR.—American Star Line owner of vessel.

APRX.—System, Kilbourne & Clark, 1000; w. l., 300, 425, 600; rates, all classes 4 c per word.

APUS.—Range, 200, system, I. W. T. Co., 1000; w. l., 300, 600; station operated and controlled by I. W. T. Co.

ASLAUG (KDFY).—Name changed to Winneconne.

ATENAS.—Range, 300; system, Wireless Specialty Apparatus Co.

BACCARAT.—Range, 150; system, Marconi, 1000; w. l., 300, 600; rates, North and South American service, 4 c per word; transoceanic, 4 c per word; and Great Lakes, 2 c per word.

BRUSH.—Range, 300; system, Navy-Liberty, 1000; w. l., 300, 450, 600; station operated and controlled by S. O. R. S.

CADARETTA.—System, Navy-Kilbourne & Clark.

CARIB (KUZX).—Range, 150; system, Kilbourne & Clark, 1000; w. l., 300, 425, 600.

CASIANA.—Range, 200; w. l., 300, 450, 600.

CHALMETTE.—Station operated and controlled by owner of vessel.

CHIPPewa.—Range, 150; system, Marconi, 1000; w. l., 300, 600; rates, North and South American service, 4 c per word; transoceanic, 4 c per word; Great Lakes, 2 c per word; station operated and controlled by owner of vessel.

CLEMENT SMITH.—Calvert Navigation Co. owner of vessel.

COPPENAME.—Range, 350.

CREOLE.—Station operated and controlled by owner of vessel.

EASTERN ADMIRAL.—Correct call letters are KURM.

EASTERN SWORD.—Range, 200; system, Navy-Simon, 1000; w. l., 300, 450, 600; station operated and controlled by S. O. R. S.

EAGLE.—Range, 150; system, Marconi, 640; service, PG; hours, X; rates, all classes, 4 c per word; station operated and controlled by R. C. of A.

EL ALMIRANTE.—Station operated and controlled by owner of vessel.

EL CAPITAN.—Station operated and controlled by owner of vessel.

EL CID.—Station operated and controlled by owner of vessel.

EL MUNDO.—Station operated and controlled by owner of vessel.

EL NORTE.—Station operated and controlled by owner of vessel.

EL ORIENTE.—Station operated and controlled by owner of vessel.

EL RIO.—Station operated and controlled by owner of vessel.

EL SOL.—Station operated and controlled by owner of vessel.

EL SUD.—Station operated and controlled by owner of vessel.

EL VALLE.—Station operated and controlled by owner of vessel.

EXCELSIOR.—Station operated and controlled by owner of vessel.

FLORABA.—Range, 300; system, Cutting & Washington Radio Corp., 1000; w. l., 300, 450, 600; hours, X; rates, 4 c per word for all classes; station operated and controlled by I. W. T. Co.

FOREST KING.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 425, 600; hours, X; rates, all classes, 4 c per word; station operated and controlled by S. O. R. S.

R. S. GRIFFDU.—Range, 200; system, Kilbourne & Clark, 1000; w. l., 300, 425, 600.

HOBOKEN.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 440, 525, 600; Todd Shipbuilding Co. owner of vessel station operated and controlled by S. O. R. S.

IRIS.—Swayne & Hoyt owner of vessel.

JERTHA.—Range, 300; system, Federal arc; w. l., 300, 600; hours, X; station operated and controlled by S. O. R. S.

FISH CANNERS No. 1.—Correct name, Van Camp No. II; range, 150; system, Kilbourne & Clark, 1000; w. l., 300, 600; service, PG; hours, X; rates, all classes of service, 4 c per word; station operated and controlled by S. O. R. S.

J. L. REISS.—Minnesota Transit Co. owner of vessel.

JUVIGNY.—Range, 150; system, Marconi, 1000; w. l., 300, 600; rates, North and South American, 4 c per word; transoceanic, 4 c per word; Great Lakes, 2 c per word; station operated and controlled by owner of vessel.

LAKE FLOURNOY.—Range, 200; system, Navy, 1000; w. l., 300, 450, 600.

LAKE HECTOR.—Range, 200; system, Navy-Marconi, 1000; w. l., 300, 450, 600.

MERCER VICTORY.—System, Navy-Lowenstein.

MOMUS.—Station operated and controlled by owner of vessel.

MUNAMAR.—W. L., 300, 450, 600.

NORA.—Grace S. S. Co. owner of vessel.

NORTHLAND (WGJ).—Atlas S. S. Co. owner of vessel.

OLD NORTH STATE.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600; station operated and controlled by R. C. of A.

PERE MARQUETTE.—Range, 150; system, Marconi, 1000; w. l., 300, 600; service, PG.

RICHARD PECK.—System, National, 260; w. l., 300, 450, 600.

ROMAGNE.—Range, 150; system, Marconi, 1000; w. l., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c per word; transoceanic, 4 c per word; Great Lakes, 2 c per word; station operated and controlled by owner of vessel.

SAHALE.—System, Navy-Wireless Specialty Apparatus Co.

SANTA RITA (WTG).—Range, 200; system, Marconi, 1000; w. l., 300, 450, 600; rates, 4 c per word for all classes of service; station operated and controlled by R. C. of A.

SANTA VERONICA.—Range, 150; system, Marconi, 1000; w. l., 300, 600.

SCHODACK.—System, Navy-Wireless Specialty Apparatus Co.

SENECA.—Range, 150; system, Marconi, 1000; w. l., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c per word; transoceanic, 4 c per word; Great Lakes, 2 c per word; station operated and controlled by owner of vessel.

TOOPI.—Range, 150; system, Lowenstein, 1000; w. l., 300, 378, 450, 600.

TOPILA.—Station operated and controlled by owner of vessel.

TORRES.—Station operated and controlled by owner of vessel.

TULADI.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.

WATERTOWN.—Hours, X.

WEST CAMPGAW.—System, Navy-Marconi.

WEST GROVE.—Range, 200; system, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.

WEST ZULU.—System, Navy-Wireless Specialty Apparatus Co.

YAQUINA.—W. L., 300, 450, 600.

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE CUTTING & WASHINGTON RADIO CORP.

Barwick.	Philip Publicker.	Theodore F. Reynolds.
Hastnai.		

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE RADIO CORPORATION OF AMERICA.

Charles H. Cramp.	Lake Gano.	Yapalaga.
Hartford.	Loki.	

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE INDEPENDENT WIRELESS TELEGRAPH CO.

Aquarius.	Hartford.	Lake Fernalda.
Barryton.	Ipswich.	Quinnipiac.
Catherine.	Isonomia.	Westmead.
E. C. Pope.	Kekoskee.	

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE SHIPOWNERS' RADIO SERVICE.

Aeolus.	Bonnie Brook.	Janelaw.
Arcturus.	Colin H. Livingstone.	Jeptha.
Argosy.	Culberson.	Pagasset.
Ashburn.	Eastern Sword.	San Pasqual.
Barlow.	Glenora.	Syros.
Bayspring.	Hannawa.	West Carmona.

STRIKE OUT ALL PARTICULARS OF THE FOLLOWING-NAMED VESSELS:

Allanhurst.	Burnwood.	Idaho.
Argus.	Bushong.	Imufka.
Arvonja.	Buttonwood.	Kickapoo.
Ashburn.	Callooh.	Krakow.
Barabos.	Centralia.	Kusdeca.
Barias.	Cocopa.	Marquette & Bessemer
Bloomington.	Dalana.	No. 1.
Boughton.	Dancey.	Pezuta.
Bournville.	Dardora.	Puyallup.
Bowesmont.	Deva.	Sapelo.
Brentwood.	Fort Harrison.	Wasagya.
Burmout.	Fort Pierce.	Yainax.
Burnham.	Fort Snelling.	Zaca.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDAK, *read* Van Camp No. II; KDFY, *read*, Winneconne. Strike out all particulars following the call signals, KEDS, KELT, KEPC, KERB, KEXC, KIBV, KICK, KJB, KLB, KOPN, KOVK, KPEE, KPUE, KPAU, KQAU, KTEU, KTIA, KUVU, KVEO, WBEQ, WCAI, WEW, WFIO, WGUO, WJH, WJUA, WKOQ, WMOE, WNOA, WNOI, WNOO, WOO, WSAA, WSN, WXAE, WXAI, WZIE, WZII.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920.]

AA-1.—*Read* T-1.
 AA-2.—*Read* T-2.
 AA-3.—*Read* T-3.
 S. P. 415 (Kemah).—Strike out all particulars.
 TALLAPOOSA.—Call letters NRV.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NABB, *read* T-2; NABZ, *read* T-3; NAKQ, strike out all particulars; NEXC, *read* Keosanqua; NIGF, *read* Ingram, Osmond; NILB, *read* T-1.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

Auberry, Calif. (6XR).—Strike out all particulars.
 Elberon, N. J. (2XJ).—*Read* Deal Beach, N. J.
 Fresno, Calif.—Strike out all particulars.
 Houston, Tex.—Strike out all particulars.

MISCELLANEOUS.

ARTICLE XXIV OF THE INTERNATIONAL CONVENTION.

It has been reported to the Bureau that a great number of operators are not adhering to Article XXIV of the International Convention, consequently causing a great amount of interference which can be avoided. For the information of all concerned, the article is herewith reprinted.

ARTICLE XXIV.

1. As a general rule, it shall be the shipboard station that calls the coastal station whether it has radiograms to transmit or not.

2. In waters where the radio traffic is very great (British Channel, etc.), a coastal station should not, as general rule, be called by a shipboard station unless the former is within normal range of the shipboard station and not until the distance of the vessel from the coastal station is less than 75 per cent of the normal range of the latter.

3. Before proceeding to call, the coastal station or the station on shipboard shall adjust its receiving apparatus to its maximum sensibility and make sure that no other correspondence is being carried on within its radius of action; if it finds otherwise, it shall wait for the first pause, unless it is convinced that its call will not be likely to disturb the correspondence in progress. The same applies in case the station desires to answer a call.

4. For calling, every station shall use the normal wave of the station it wishes to call.

5. If in spite of these precautions the transmission of a radiogram is impeded at any place, the call shall cease upon the first request from a coastal station open to public correspondence. The latter station shall in such case indicate the approximate length of time it will be necessary to wait.

6. The station on shipboard shall make known to every coastal station to which it has signaled its presence the moment at which it proposes to cease its operations and the probable duration of the interruption.

SEAMEN'S CHURCH INSTITUTE FREE MEDICAL ADVICE.

The following notice has been received from the Seamen's Church Institute, New York City:

A limited commercial radio license, call "KDKF" has been issued to the Seamen's Church Institute of New York, 25 South Street, for the purpose of giving free medical advice to vessels at sea or at anchor in the harbor between the hours of 2 and 10 p. m., Greenwich mean time, daily, except Sunday.

That officers of vessels may become familiar with this service, they are invited to attend the free medical course of lectures given at the Navigation Marine Engineering and Radio School, 25 South Street, Wednesdays at 8 p. m., Fridays at 11 a. m., and 8 p. m. on the last Saturday of each month.

For further information apply to Capt. R. Huntington, principal, telephone Broad 297.

OPENING AND CLOSING OF ALASKAN RADIO STATIONS.

Companies controlling Alaskan radio stations are requested to advise the radio inspector, 2301 L. C. Smith Building, Seattle, Wash., promptly the time of opening and closing of their stations in order that the signal office at Seattle may know when to accept messages destined for points in Alaska. It has been brought to the attention of the Bureau that a number of companies neglect to do so. For any further information regarding this subject apply to the radio inspector at Seattle.

TIMES OF WATCH FOR AMERICAN SHIPS OWNED BY THE SHIPPING BOARD HAVING ONLY ONE RADIO OPERATOR.

The following table showing the hours of watch for vessels of the Shipping Board having but one operator is herewith printed for the information of all concerned:

BULLETIN No. 66.

OCTOBER 12, 1920.

SUBJECT: Hours of radio watches for ships having one radio operator.

TO MANAGING AGENTS AND MASTERS OF SHIPPING BOARD VESSELS:

Masters of all Shipping Board vessels carrying only one radio operator shall require the operator to be on watch the hours specified below for each zone designated:

TIMES OF WATCH FOR SHIPS HAVING ONLY ONE TELEGRAPHIST.

Zones.	Western limit.	Eastern limit.	Times of watch, Greenwich mean time.
A. Eastern Atlantic, Mediterranean, North Sea, Baltic, Western Arctic Sea.	Meridian of 30° W., coast of Greenland.	Meridian of 30° E. to the south of the coast of Africa, eastern limit of Mediterranean, Black Sea, and of the Baltic, 30° E. to the north of coast of Norway.	From 8 h. to 10 h., 12 h. to 14 h., 16 h. to 18 h., 20 h. to 22 h.
B. Indian Ocean, Eastern Arctic Sea.	Eastern limit of zone A	Meridian of 90° E.....	From 0 h. to 2 h., 12 h. to 14 h., 16 h. to 18 h., 20 h. to 22 h.
C. China Sea, Western Pacific Ocean.	Eastern limit of zone B	Meridian of 160° E.....	From 0 h. to 2 h., 4 h. to 6 h., 12 h. to 14 h., 20 h. to 22 h.
D. Central Pacific Ocean...	Eastern limit of zone C.	Meridian of 140° W.....	From 0 h. to 2 h., 4 h. to 6 h., 8 h. to 10 h., 20 h. to 22 h.
E. Eastern Pacific Ocean...	Eastern limit of zone D.	Meridian of 70° W. south of the coast of America, west coast of America.	From 0 h. to 2 h., 4 h. to 6 h., 16 h. to 18 h., 20 h. to 22 h.
F. Western Atlantic Ocean and Gulf of Mexico.	Meridian 70° W. south of the coast of America, east coast of America.	Meridian of 30° W., coast of Greenland.	From 0 h. to 2 h., 12 h. to 14 h., 16 h. to 18 h., 20 h. to 22 h.

NOTE.—Time given is meridian of Greenwich, 0 hours being midnight.

BRITISH RATES.

The following information has been received from the Berne International Bureau, under Circular No. 104, October 21, 1920:

Referring to our circular letter No. 102, August 24, 1920, the British office informs us that in the aim of obtaining, as far as possible, a uniformity in fixing the telegraphic rate, the rates indicated in the nomenclature, Nos. 3 and 4, relative to the British coast stations, are now applicable only to British ships if these ships adopt the uniform rate of 0.15 franc per word, with a minimum of 1.50 francs per radiogram, respectively; 0.10 franc per word, with a minimum of 1 franc per radiogram.

The British office proposes to apply the same terms to the foreign ships, beginning 1st of January next. Consequently they beg us to give notice of this action to the administrations and to publish the changes they are to make in the official nomenclature of the radiotelegraphic stations. These modifications are:

Great Britain.—Add to note No. 3, relating to coast stations, the following paragraph:

Beginning January 1, 1921, these reduced rates (coast charge and charge combined) are applicable only in the case where the shipboard charge does not exceed 0.15 franc per word, minimum 1 franc 50. In all other cases the rate to collect is that indicated in note No. 2.

Add to note No. 4, relating to British coast stations, the following paragraph:

Beginning January 1, 1921, these reduced rates (coast charge and charge combined) are applicable only in the cases where charge on shipboard does not exceed 0.10 franc per word, minimum 1 franc. In all other cases the tax to be collected is that indicated in note No. 2.

SWEDISH RATES.

The Berne International Bureau advises this office under Circular No. 106 that the Swedish administration will, effective October 1, 1920, apply a tax over the telegraph lines of Sweden for radiograms originating in or destined to Sweden and exchanged directly with Swedish coast stations of 0.14 franc per word, with a minimum of 1.40 francs for ordinary radiograms, and 0.42 franc per word, with a minimum of 4.20 francs for urgent radiograms.

FLAMBOROUGH HEAD DIRECTION FINDING STATION.

The direction finding station at Flamborough Head, latitude 54° 07' N., longitude 0° 05' W., has been reopened.

NORMAL TIME REESTABLISHED.

Under Circular No. 107, the Berne International Bureau advises that the normal legal hour has been reestablished in the following-named countries:

Belgium, night of the 23d and 24th of October.

Bulgaria, October 2.

France, night of the 23d and 24th of October.

Portugal, night of the 14th and 15th of October.

NEW COUNTRIES ADMITTED TO THE LONDON CONVENTION.

China and Venezuela have adhered to the London Convention, under date of October 26, this year.

ADDITIONAL COPIES
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WASHINGTON, D. C.
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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, January 3, 1921—No. 45

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, August 1, 1919.

To collectors of customs, radio inspectors, and others concerned:

This publication, which was discontinued during the war, is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of Aug. 15, 1919) are printed in this Bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
WILLIAM C. REDFIELD,
Secretary of Commerce.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Camotes, P. I.	KDMW.	.....	.....	.....	Philippine Insular Government.
Fort Worth, Tex. ¹ ...	KDMK.	500	PR	N	Continental Radio Telegraph & Telephone Co.
Galveston, Tex. ² ...	KDLZ.	300, 375, 425, 600	PR	X	Sugarland Industries.
Port Isabel, P. I.	KDMX.	.....	.....	.....	Philippine Insular Government.
Sugarland, Tex. ² ...	KDLY.	300, 375, 425, 600	PR	X	Sugarland Industries.

¹ Loc., 0 97° 20' 00", N. 32° 44' 00" (approximately); system, composite, 480; range, 80; rates, to Dallas, Tex., 2c per word; Wichita Falls, Tex., 2½c per word.

² System, Deforest; range, 500; rates, none.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
Agwimars.....	KDMC	Cents.	Cents.	PG	X	Atlantic, Gulf & West Indies S. S. Lines.	I. W. T. Co.
Agwisea.....	KDMB	.....	.....	PG	X	do.....	Do.
Agwiworld.....	KDMD	.....	.....	PG	X	do.....	Do.
City of Elwood.....	KDMV	4	4	PG	X	U. S. Shipping Board.	
District of Columbia..	KDMZ	4	4	PG	X	do.....	
Estrada Palma.....	KDMG	.....	.....	.....	.....	Florida East Coast Railway Co.	
Eugene V. R. Thayer.	KDMA	.....	.....	PG	X	Sinclair Navigation Co.	
John Worthington.....	KDMN	.....	.....	.....	.....	.....	
Joseph M. Cudahy.....	KDMT	.....	.....	PG	X	Sinclair Navigation Co.	
Memnon.....	KDMH	4	4	PG	X	U. S. Shipping Board.	
Moffitt.....	KDME	4	4	PG	X	do.....	
Muriel.....	KDMO	.....	.....	PG	X	Muriel Motorship Corp.	
Nacata.....	KDMM	4	4	PG	X	U. S. Shipping Board.	
Namasket.....	KDMI	4	4	PG	X	do.....	
Oureq.....	KDMF	4	4	PG	N	do.....	
Peralta.....	KDMJ	4	4	PG	X	do.....	
P. J. Reilly.....	KDMY	.....	.....	PG	X	National Oil & Transport Co.	
Samuel L. Fuller.....	KDMS	.....	.....	PG	X	Sinclair Navigation Corp.	
S. C. T. Dodd.....	KDML	4	8	PG	X	Standard Oil Co. of Calif.	
W. H. Libby.....	KDMP	4	8	PG	X	Standard Oil Co. of N. J.	
Wichita.....	KDMU	4	4	PG	X	U. S. Shipping Board.	
Wolverine State.....	KDMQ	4	4	PG	N	do.....	
W. S. Miller.....	KDMR	.....	.....	.....	.....	.....	

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDLY	Sugarland, Tex.....c	KDMM	Nacata.....b
KDLZ	Galveston, Tex.....c	KDMN	John Worthington.....b
KDMA	Eugene V. R. Thayer.....b	KDMO	Muriel.....b
KDMB	Agwisa.....b	KDMP	W. H. Libby.....b
KDMC	Agwimars.....b	KDMQ	Wolverine State.....b
KDMD	Agwiworld.....b	KDMR	W. S. Miller.....b
KDME	Moffitt.....b	KDMS	Samuel L. Fuller.....b
KDMF	Ouroq.....b	KDMT	Joseph M. Cudahy.....b
KDMG	Estrada Palma.....b	KDMU	Wichita.....b
KDMH	Memnon.....b	KDMV	City of Elwood.....b
KDMI	Namsaket.....b	KDMW	Camotes, P. I.....c
KDMJ	Peralta.....b	KDMX	Port Lebak, P. I.....c
KDMK	Fort Worth, Tex.....c	KDMY	P. J. Reilly.....b
KDML	S. C. T. Dodd.....b	KDMZ	District of Columbia.....b

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Cincinnati ¹	NISN	Omaha ¹	NISL
Detroit ¹	NISP	Richmond ¹	NISQ
Fathomer.....	NESR	Trenton ¹	NISR
Memphis ¹	NISS	Tulsa ¹	NIST
Milwaukee ¹	NISM		

¹ System, U. S. Navy; w. l., 300, 500; service, PG; hours, N; rates, North and South American service, 4 c. per word; transoceanic service, 8 c. per word.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NESR	Fathomer.....b	NISQ	Richmond.....b
NISL	Omaha.....b	NISR	Trenton.....b
NISM	Milwaukee.....b	NISS	Memphis.....b
NISN	Cincinnati.....b	NIST	Tulsa.....b
NISP	Detroit.....b		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, only.]

Station.	Call signal.	Station controlled by—
Ames, Iowa.....	9YI	Iowa State College.
Bozeman, Mont.....	7XB	Montana State College.
Columbia, Mo.....	9YM	University of Missouri.
Dallas, Tex.....	5ZC	Frank M. Corlett.
Dallas, Tex.....	5ZE	Bennett Emerson.
Delaware, Ohio.....	8YK	Ohio Wesleyan University.
Greensboro, N. C.....	4ZA	James R. Winkle.
Houston, Tex.....	5ZX	Alfred P. Daniel.
Media, Pa.....	3ZM	Simon Delbert, jr.
New York, N. Y.....	2XK	L. M. Cockaday & Co.
New York, N. Y.....	2XP	Radio Corporation of America.
New York, N. Y.....	2XU	Samuel E. Adair.
Philadelphia, Pa.....	3YI	Knights of Columbus School.
Polytechnic, Mont.....	7XD	Billings Polytechnic Institute.
Rapid City, S. Dak.....	9YW	South Dakota State School of Mines.
Richmond, Va.....	3ZL	Clay D. Blair.
San Fernando, Calif.....	6ZN	B. H. Dennis and C. A. Taylor.
Sanford, Fla.....	5ZH	Clarence M. Wickes.
San Francisco, Calif.....	6XO	National Radio Co.
St. Louis, Mo.....	9XS	Manhattan Electrical Supply Co.
St. Louis, Mo.....	9ZB	Lester A. Benson.
Tacoma, Wash.....	7ZL	Anton R. Tingstad.
Valley Stream, N. Y.....	2ZL	J. Owen Smith.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
2XK	Second district:	6ZN	Sixth district:
2XP	New York, N. Y.	6XO	San Fernando, Calif.
2XU	Do.		San Francisco, Calif.
2ZL	Do.		Seventh district:
	Valley Stream, N. Y.	7XB	Bozeman, Mont.
3YI	Third district:	7XD	Polytechnic, Mont.
3ZL	Philadelphia, Pa.	7ZL	Tacoma, Wash.
3ZM	Richmond, Va.	8YK	Eighth district: Delaware, Ohio.
4ZA	Media, Pa.		Ninth district:
	Fourth district: Greensboro, N. C.	9XS	St. Louis, Mo.
5ZC	Fifth district:	9YI	Ames, Iowa.
5ZG	Dallas, Tex.	9YM	Columbia, Mo.
5ZH	Do.	9YW	Rapid City, S. Dak.
5ZX	Sanford, Fla.	9ZB	Lester A. Benson.
	Houston, Tex.		

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name = Name of station.
G. loc. = Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call = Call letters assigned.
System = Radio system used and sparks per second.
Range = Normal range in nautical miles.
W. L. = Wave lengths assigned: Normal wave lengths in italics.
Service = Nature of service maintained:
PG=General public.
PR=Limited public.
P =Private.
O =Government business exclusively.

- Hours =Hours of operation:
 N =Continuous service.
 X =No regular hours.
 m =a. m. (12m=midday).
 s =p. m. (12s=midnight).
- Rates =Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
- I. W. T. Co.=Independent Wireless Telegraph Co.
 R. C. of A =Radio Corporation of America.
 S. O. R. S. =Ship Owners Radio Service.
 Co. =Company.
 Corp. =Corporation.
 & =And.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAME OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

- ABSECON.—Range, 200; system, Navy-Marconi, 1000.
 ADMIRAL WAINWRIGHT.—Dollar S. S. Line, owner of vessel.
 ANN ARBOR No. 3.—Range, 150; system, Marconi, 1000.
 ANN ARBOR No. 6.—Range, 150; system, Marconi, 1000.
 ARTEMIS.—Range, 150; system, Navy-Marconi, 1000; w. l., 300, 600; service, PG; rates, 4 c per word for all classes of service.
 BACCARAT.—Rates, Great Lakes service, 2 c per word.
 CHALMETTE.—W. l., 300, 600.
 CITY OF BUFFALO.—Range, 150; system, Marconi, 1000.
 CORDOVA.—Rates, 4 c per word for all services.
 CROWN CITY.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
 CORSAIR.—W. l., 300, 450, 600.
 CUBA.—System, Cutting & Washington, 1000; w. l., 300, 450, 600; rates, North and South American service, 4 c per word; transoceanic, 8 c per word.
 DULCINO.—American Sugar Transit Corporation, owner of vessel.
 DUNGANNON.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600; hours, X.
 GLENDOWLE.—Glendowle S. S. Corporation, owner of vessel.
 GUARDSMAN.—T. A. Scott Co., owner of vessel.
 HALWAY.—Range, 300; system, Federal arc; w. l., 300, 600; hours, X.
 HAMILTON.—Old Dominion Transportation Co., owner of vessel.
 HINCKLEY.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
 HOBOKEN.—Erie Basin Towing & Hoisting Co., owner of vessel.
 IRIS.—Hours, X.
 JEFFERSON (KOD).—Old Dominion Transportation Co., owner of vessel.
 JOHN R. GIBBONS.—Range, 300; system, Marconi, 1000; range, 300, 600, hours, X.
 KERKENNA.—American Ship & Commerce Navigation Corporation, owner of vessel.
 KIOWA.—Clyde S. S. Co., owner of vessel.
 LACKAWANNA.—R. Bruce Somerville, owner of vessel.
 LAKE GETAWAY.—Range, 200; system, Navy-Simon, 1000; w. l., 300, 450, 600; service, PG; hours, X.
 LAVADA.—Range, 300; system, Federal arc; w. l., 300, 450, 600; hours, X.
 MARACAY.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600; service, PG; hours, X; rates, 4 c per word for all services; station operated and controlled by owner of vessel.
 MOHEGAN.—Range, 75.
 MONTGOMERY CITY.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; hours, X; rates, 4 c per word for all services; station operated and controlled by R. C. of A.
 NEW ORLEANS.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
 NOMA.—Range, 300; system, Cutting & Washington, 1000; w. l., 300, 450, 600; rates, 4 c per word for all services; Rodman Wanamaker owner of vessel; station operated and controlled by owner of vessel.
 PERE MARQUETTE 17.—Range, 150; system, Marconi, 1000; w. l., 300, 600; service, PG.
 PERE MARQUETTE 19.—Range, 150; system, Marconi, 1000; w. l., 300, 600; service, PG; rates, Great Lakes service, 2 c. per word.
 QUEEN.—Range, 150.
 SALINAS.—Name changed to Hudsonian.

SANTA ELISA.—W. 1., 300, 450, 600.

SENECA.—West Indian Navigation Co., owner of vessel.

SIERRA (WHJ).—Name changed to Gdansk; Polish-American Navigation Corporation, owner of vessel.

TOFA TOFA.—Range, 300; system, Federal arc; w. 1., 300, 600.

TWILITE.—Name changed to Standtow No. 1.

WEST CARMONA.—System, Federal arc; w. 1., 300, 600; hours, X.

WILLIAM H. DOHENY.—Range, 300; system, Marconi, 1000; w. 1., 300, 450, 600; service, PG; hours, X; rates, 4 c. per word for all classes; Pan-American Petroleum & Transport Co., owner of vessel; station operated and controlled by R. C. of A.

WILLIAM ISOM.—American-Italian S. S. Co., owner of vessel.

WINONA.—W. 1., 300, 600.

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE SHIPOWNERS' RADIO SERVICE:

City of Sherman.	Haymon.	Mosella.
Cuprum.	Hopatcong.	Narbo.
Eastern Glade.	John Stevens.	Wacosta.
Emergency Aid.	Medon.	West Honaker.
George Pierce.	Meton.	Yalza.
Halo.	Mevania.	

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE RADIO CORPORATION OF AMERICA:

Anaconda.	Eastern Gale.	Manstee.
Bellhaven.	Hampton Roads.	Montgomery.
City of Fairbury.	Lake Grogan.	West Camargo.
City of Rayville.	Lake Lilicusun.	West Nilus.

THE STATIONS OF THE FOLLOWING-NAMED VESSELS ARE OPERATED AND CONTROLLED BY THE INDEPENDENT WIRELESS TELEGRAPH CO.:

Askawake.	Lake Flagstaff.	West Wind.
Creole State.	Portsmouth.	William H. Webb.
John Jay.	Reaper.	

STRIKE OUT ALL PARTICULARS OF THE FOLLOWING-NAMED VESSELS:

Bonham.	Undaunted.	Vacuum II.
Dreadnought.		

THE FOLLOWING CORRECTIONS SHOULD BE MADE TO THE LIST OF "COMMERCIAL AND GOVERNMENT RADIO STATIONS OF THE UNITED STATES," EDITION JUNE 30, 1920 (P. 66):

WQAI, *read* Agria; WQAU, *read* Hoosac; WQD, *read* Hisko; and WQE, *read* Harvey H. Brown.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KPO, *read* Standtow No. 1; KUCL, *read* Hudsonian; WHJ, *read* Gdansk. Strike out all particulars following the call signals, KIMK, WGL, WGM, and WKIE.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920.]

Concord, *read* NIRV.
 Indiana, *read* NIRS.
 Iowa, *read* NIRP.
 Marblehead, *read* NIRR.
 Massachusetts, *read* NIRQ.
 Raleigh, *read* NIRT.

STRIKE OUT ALL PARTICULARS OF THE FOLLOWING-NAMED VESSELS:

S. C. 36.	S. C. 107.	S. C. 244.
S. C. 91.	S. C. 222.	S. C. 247.
S. C. 97.	S. C. 225.	S. C. 260.
S. C. 98.	S. C. 240.	S. C. 323.
S. C. 101.	S. C. 241.	S. C. 416.
S. C. 103.	S. C. 242.	

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NGK, *read* NIRR; NHQ, *read* NIRS; NHT, *read* NIRP; NJT, *read* NIRQ; NQH, *read* NIRV; and NTF, *read* NIRT. Strike out all particulars following the call signals, NOCB, NOFT, NOGD, NOGF, NOGK, NOGM, NOGR, NOPD, NOPJ, NOQD, NOQF, NOQG, NOQJ, NOQM, NORD, NOVQ, and NOZN.

MISCELLANEOUS.

The following information has been received from the Berne International Bureau:

RADIO ACCOUNTS FOR GERMAN SHIPS.

The German Wireless Telegraph Co., known as Debeg, is prepared to assume, as formerly, the liquidation of accounts for radiotelegrams exchanged between German ships (Debeg system) and foreign coast stations. The company requests administrators and companies which approve this special method of procedure to forward to it accounts relative to charges.

AUSTRALIAN POST OFFICE NOW ADMINISTERING RADIO LAW.

Hereafter the Postmaster General's Department and not the Department of the Navy will be in charge of the application of the radiotelegraph law as well as in control of coast stations and ship stations in the jurisdiction of the Australian Federation. Communications hereafter relative to wireless telegraphy should be addressed accordingly to the Secretary, Postmaster's Department, Melbourne, Australia.

INCREASE IN CANADIAN RATES.

Beginning November 8, 1920, Canadian land lines will increase their relative share of the charges for radiotelegrams. The increase will vary from 1 to 4 cents a word. Until the Berne International Bureau has printed a revised table of charges under the heading "Canada" in the third part of the nomenclature of telegraph stations ships communicating with Canadian stations can obtain from them on request all necessary instructions.

NEW CALL LETTERS FOR JAPAN.

Owing to insufficient call letters which have been reserved for Japan, the general administration of posts and telegraphs of Japan will assign hereafter to ship stations under direction of the Japanese administration and to those of Japanese possessions call letters composed of four letters by means of the addition of the letter "A" at the end of combinations of three letters commencing with "J."

NEW CALL LETTERS FOR CZECHOSLOVAKIA.

The call letters OKA to OKZ have been reserved for this Republic.

ADDITIONAL INFORMATION REGARDING RADIO STATION AT DEVIZES.

The British post office advises that the Government station at Devizes, call signal GKU, is open for communication with ships by means of continuous wave wireless telegraphy. The wave length used is 2100 meters. The station will normally be open at all times for the receipt of messages from ships, but it will, as a rule, call ships only during the following periods: 1 to 1.30 a. m., 5 to 5.30 a. m., 9 to 9.30 a. m., 1 to 1.30 p. m., 5 to 5.30 p. m., and 9 to 9.30 p. m., Greenwich mean time. The station will not, however, be available for communication during the period of 3 minutes every half hour commencing at 15 and 45 minutes past the hour (G. m. t.), as British ships using wave lengths other than 600 meters for any special purpose are required during these periods to keep watch on a wave length of 600 meters.

The rates of charge for messages sent through Devizes radio are the same as those for messages through other Government shore stations of Great Britain.

ARTICLE XLV OF THE INTERNATIONAL CONVENTION.

The Bureau is informed that section 3 of this article is being constantly violated by careless operators. For the information of all concerned it is herewith printed:

Time signals and meteorological radiograms shall be transmitted one after the other in such a way that the total time occupied in their transmission shall not exceed 10 minutes. As a general rule, all radio stations whose transmissions might interfere with the reception of such signals and radiograms shall remain silent during the transmission in order that all stations desiring it may be able to receive the same. Exception shall be made in cases of distress calls and of state telegrams.

OPERATOR'S LICENSE SUSPENDED.

License No. 22042, issued at Baltimore, June 26, 1920, has been suspended for a period of three months on account of the holder of the license violating section 4 of the act of August 13, 1912, in that he interfered with a distress message.

DESIGNATING LETTERS SHOWING COMPANIES CONTROLLING STATION ON AMERICAN VESSELS.

Beginning February 1, this year, the following letters should be inserted between the number of the message and the check so as to designate the radio company controlling the station and responsible for the tolls:

- M..Radio Corporation of America.
- S..Ship Owners Radio Service.
- T..Tropical Radio Telegraph Co.
- I..Independent Wireless Telegraph Co.
- C..Cutting & Washington Radio Corp.
- H..American-Hawaiian S. S. Co.
- L..International Radio Telegraph Co.

To illustrate:

Present method: "Radio SS ZULIA 1 9 Tenth 410pm"

Proposed method: "Radio SS ZULIA 1M 9 Tenth 410pm"

When a station relays a message, it should use the designating letter of the station from which the message originates.

This practice will apply to all traffic originating on board ship irrespective whether a message is destined to another ship or to a shore station in the United States.

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, February 1, 1921—No. 46

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ABBREVIATIONS.

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 P =Private.
 O = Government business exclusively.
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 X =No regular hours.
 m =a. m. (12m= midday).
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 I. W. T. Co.=Independent Wireless Telegraph Co.
 R. C. of A. =Radio Corporation of America.
 S. O. R. S. =Ship Owners Radio Service.
 Co. =Company.
 Corp. =Corporation.
 & =And.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Bakersfield, Calif. ¹ ...	KDNT...	425	PR	X	San Joaquin Light & Power Corp.
Fresno, Calif. ²	KDNU...	425	PR	X	Do.
Seattle, Wash. ³	KDOG...	300, 800	PG	N	Puget Sound Wireless Telegraph Co.

¹ Loc., 0 118° 50' 00", N. 35° 20' 00" (approximately); system, composite, 500; range, 125; rates, none.

² Loc., 0 119° 49' 00", N. 36° 43' 00" (approximately); system, composite, 600; range, 125; rates, none.

³ Loc., 0 122° 22' 12", N. 47° 39' 06"; system, composite, 750; range, 200; rates, ship service 6c per word.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Agwilake.....	KDNN			PG	X	Atlantic, Gulf & West Indies S. S. Lines.	I. W. T. Co.
Aisne.....	KDNC	4	4	PG	N	U. S. Shipping Board.	
Ala.....	KDOB	4	4	PG	X	do.	
Albert E. Watts.....	KDOK			PG	X	Sinclair Navigation Co.	Owner of vessel.
Annapolis.....	KDOM					City of Baltimore	R. C. of A.
Astrea.....	KDOP	4	4	PG	X	Davidson Chemical Co.	
Bella.....	WAX						Do.
Bessemer City.....	KDOF	4	4	PG	N	U. S. Steel Products Co.	
Cebu.....	KDOC					Compania Maritima...	
City of Brunswick.....	KDNQ	4	4	PG	X	U. S. Shipping Board.	
City of Dalhart.....	KDNP	4	4	PG	X	do.	
Crampton Anderson.....	KDOH			PG	X	Pan-American Petroleum & Transport Co.	
Dewey.....	KDNF			PG	X	Andrew Olsen	
Durham.....	KDNL			PG	X	France & Canada Oil Transport Co.	
El Isleo.....	KDNA			PG	X	Southern Pacific Co.	
El Lago.....	KDNW			PG	X	do.	
Favorite.....	KDNY						
F. C. Latrobe.....	KDOL					City of Baltimore	
Gorgona.....	KDNZ						
Gulfking.....	KDNO			PG	X	Gulf Refining Co.	
Hawkeye State.....	KDNV	4	4	PG	N	U. S. Shipping Board.	
Kingfisher.....	KDNJ			PG	X	Independent Oil Transportation Co.	
Lake Miraflores.....	KDNR	4	4	PG	X	U. S. Shipping Board.	
Livingstone Roe.....	KDOD			PG	X	Standard Oil Co. of N. J.	
M. F. Elliott.....	KDNK			PG	X	Standard Oil Co.	
Naamhok.....	KDNE	4	4	PG	X	U. S. Shipping Board.	
Quinnault.....	KDND			PG	X	W. H. Wood	
Richmond.....	KDOQ			PG	X	Aiken Towboat Co.	
Sea Lion.....	KDOJ						
Stonewall.....	KDOV			PG	X	Garland S. S. Corp.	
Su Jerseyco.....	KDNH	4	4	PG	X	Submarine Boat Corp.	Transmarine Corp.
Sunewarkeo.....	KDNI	4	4	PG	X	do.	Do.
Sunnugentco.....	KDNX	4	4	PG	X	do.	Do.
Swift Arrow.....	KDOS	4	4	PG	X	U. S. Shipping Board.	
Swiftsure.....	KDNG	4	4	PG	X	do.	
Thomas H. Wheeler.....	KDOR						
Tours.....	KDNB	4	4	PG	N	U. S. Shipping Board.	
Volant.....	KDON	4	4	PG	X	Davidson Chemical Co.	R. C. of A.
Wenatchee.....	KDOT	4	4	PG	N	U. S. Shipping Board.	
Wisdom II.....	KDNM					E. A. Salisbury	
Yorba Linda.....	KDNS			PG	X	General Petroleum Corp.	

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDNA	El Isleo.....b	KDNW	El Lago.....b
KDNB	Tours.....b	KDNX	Sunuganteo.....b
KDNC	Aisne.....b	KDNY	Favorite.....b
KDND	Quinsault.....b	KDNZ	Gorgona.....b
KDNE	Naambok.....b	KDOB	Ala.....b
KDNF	Dewey.....b	DKOC	Cebu.....b
KDNG	Swiftsure.....b	KDOD	Livingstone Roe.....b
KDNH	Sulawesi.....b	KDOF	Bessemer City.....b
KDNI	Sunewarkoo.....b	KDOG	Seattle, Wash.....c
KDNJ	Kingfisher.....b	KDOH	Crampton Anderson.....b
KDNK	M. F. Elliott.....b	KDOJ	Sea Lion.....b
KDNL	Durham.....b	KDOK	Albert E. Watts.....b
KDNM	Wisdom II.....b	KDOL	F. C. Latrobe.....b
KDNN	Agwilake.....b	KDOM	Annapolis.....c
KDNO	Gulfsing.....b	KDON	Volant.....b
KDNF	City of Dalhart.....b	KDOP	Astrea.....b
KDNQ	City of Brunswick.....b	KDOQ	Richmond.....b
KDNR	Lake Miraflores.....b	KDOR	Thomas H. Wheeler.....b
KDNS	Yorba Linda.....b	KDOS	Swift Arrow.....b
KDNT	Bakersfield, Calif.....c	KDOT	Wenatchee.....b
KDNU	Fresno, Calif.....c	KDOV	Stonewall.....b
KDNV	Hawkeye State.....b	WAX	Bella.....b

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Cape Elizabeth, Me.....	NAB	U. S. Navy.
Eagle Harbor, Mich.....	NUG	Do.
Empire, Oreg.....	NPF	Do.
Grand Marais, Mich.....	NZT	Do.
Imperial Beach, Calif.....	NPL	Do.
Ocean Park, Wash.....	NPE	Do.
Point Loma, Calif.....	NPL	Do.
Poyners Hill, N. C.....	NCZ	Do.
Slip Point, Wash.....	NPD	Do.
Surfside, Mass.....	NBS	Do.
Thunder Bay Island, Mich.....	NSM	Do.
Whitefish Point, Mich.....	NZT	Do.

All of the above are radio compass stations and work continuously on 800 meters.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NAB	Cape Elizabeth, Me.....c	NPL	Imperial Beach, Calif.....c
NBS	Surfside, Mass.....c	NPL	Point Loma, Calif.....c
NCZ	Poyners Hill, N. C.....c	NSM	Thunder Bay Island, Mich.....c
NPD	Slip Point, Wash.....c	NUG	Eagle Harbor, Mich.....c
NPE	Ocean Park, Wash.....c	NZT	Grand Marais, Mich.....c
NPF	Empire, Oreg.....c	NZT	Whitefish Point, Mich.....c

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, only.]

Station.	Call signal.	Station controlled by—
Atlanta, Ga.....	4YJ	Knights of Columbus School.
Belleville, Ill.....	9XX	Chas. B. Harrison.
Burlingame, Calif.....	6ZR	Hall Berringer.
Collegeville, Minn.....	9XT	St. Johns University.
Galesburg, Ill.....	9XW	Lombard College.
Medford, Mass.....	1XE	American Radio and Research Corp.
Parkersburg, Pa.....	3ZO	Horace A. Beale, jr.
Princeton, N. J.....	3XM	David Richardson.
Reno, Nev.....	6ZO	Hadley S. Beedle.
Urbana, Ill.....	9XZ	Paul G. Busey.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XE	First district: Medford, Mass.	6ZO	Sixth district: Reno, Nev.
3XM	Third district: Princeton, N. J.	6ZR	Burlingame, Calif.
3ZO	Parkersburg, Pa.	9XT	Ninth district: Collegeville, Minn.
4YJ	Fourth district: Atlanta, Ga.	9XW	Galesburg, Ill.
		9XX	Belleville, Ill.
		9XZ	Urbana, Ill.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

Butte, Mont.—Montana Power Co. owner of station.

Great Falls, Mont.—Read Rainbow, Mont. (near Great Falls).

New London, Conn.—Range, 150-300; system, composite, 480 and Elwell arc; w. l., 300, 600, 1800.

Seattle, Wash. (KPE).—Range, 300; w. l., 300, 450, 550, 600; service, PR: rates, ship service free.

Slasconset, Mass.—Range, 300.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAME OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

A. L. KENT.—Range, 300; system, Simon, 1000; w. l., 300, 600; rates, 4c. per word for all classes of service; station operated and controlled by owner of vessel.

ANTHRACITE BRIDGE.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 600.

BIBBCO.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.

BRAZOS.—Name changed to SAN LORENZO.

CITY OF FORT WORTH.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 600.

CITY OF MIAMI.—Range, 300; system, Wireless Specialty Apparatus Co., 1000; hours, N; 4c. per word for all classes of service.

COMMONWEALTH.—Hours, X.

DE KALB.—Name changed to MOUNT CLAY. American Ship & Commerce Navigation Corp., owner of vessel.

EASTPORT.—System, Navy-Marconi; w. l. 300, 450, 600.

ESTRADA PALMA.—Florida East Coast Car Ferry Co., owner of vessel.

EXCELSIOR.—W. l. 300, 600.

EVERETT.—Range 200; system, Gray & Danielson, 240; w. l. 300, 600; hours, X; rates, North and South American service, 4c. per word; transoceanic, 8c. per word; station operated and controlled by owner of vessel.

FRANK H. BUCK.—Range, 300.

FRED BAXTER.—Range, 200; system, Gray & Danielson, 240.

GUARDSMAN.—System, Navy-Simon.

HAXTUM.—Range, 300; system, Marconi, 1000; w. l. 300, 450, 600.

HAYDEN.—Range, 300; system, Navy-Marconi, 1000; w. l. 300, 450, 600.

HOMER.—Range, 200; system, Gray & Danielson, 240; w. l. 300, 600; hours, X; rates, North and South American service, 4c. per word; transoceanic, 8c. per word; station operated and controlled by owner of vessel.

HYBERT.—Range, 300; system, Navy-Marconi, 1000; w. l. 300, 600.

I. C. WHITE.—Range, 300; system, Marconi, 1000; w. l. 300, 600; rates, 4c. per word for all classes of service.

INNOKO.—Range, 300; system, Navy-Liberty; w. l. 300, 450, 600.

KERLEW.—Name changed to MOUNT SIDNEY; American Ship & Commerce Navigation Corp., owner of vessel.

KEROWLEE.—Name changed to MOUNT STERLING.

LAKE FESTINIA.—*Read LAKE FESTINA.*

LAKE ORANGE.—System, Navy-Wireless Specialty Apparatus Co.

LAKESHORE.—Range, 200; system, Navy, 1000.

LAKE WINOOSKI.—System, Navy-Marconi, 1000.

LIBERTY LAND.—System, Navy-Marconi, 1000; w. l. 300, 450, 600.

LIGONIER.—System, Independent Wireless Telegraph Co., 1000; station operated and controlled by I. W. T. Co.

MOHAWK.—Hours, X.

NEW HAVEN.—Range, 75; hours, X.

PALO ALTO.—Range, 200; system, Navy-Kilbourne & Clark, 1000; w. l. 300, 450, 600.

PERE MARQUETTE 18.—Range, 150; system, Marconi, 1000; w. l. 300, 600; service, PG; rates, Great Lakes service, 2c. per word.

PERE MARQUETTE 20.—Range, 150; system, Marconi, 1000; w. l. 300, 600; service, PG; rates, Great Lakes service, 2c. per word.

REGINOLITE.—Name changed to Baytown.

RETRIEVER.—Name changed to Warbler.

RICHARD PECK.—Hours, X.

SALEM COUNTY.—System, Navy-Simon, 1000; w. l. 300, 450, 600; hours, X.

SALVOR.—Name changed to Willett.

SEPULGA.—Name changed to Fleetco.

SHOOTERS ISLAND.—W. l. 300, 450, 600.

SINASTA.—Range, 300; system, Marconi, 1000; w. l. 300, 450, 600.

SISKIYOU.—Range, 200; system, Gray & Danielson, 240; rates, North and South American service, 4c. per word; transoceanic, 8c. per word; station operated and controlled by owner of vessel.

S. O. Co. No. 95.—System, Marconi, 1000; w. l. 300, 450, 600.

SYROS.—Range, 300; system, Navy-Marconi, 1000; w. l. 300, 600.

WATERBURY.—Range, 300; system, Navy-Marconi, 1000; w. l. 300, 450, 600.

WEST CAMAK.—Range, 300; system, Navy-Marconi, 1000; w. l. 300, 450, 600.

WILHELM JEBSEN.—Name changed to Frederic Ewing; Pan-American Petroleum & Transport Co., owner of vessel.

YAKA.—Range, 300; system, Navy-Marconi, 1000; w. l. 300, 450, 600.

The stations of the following-named vessels are operated and controlled by the Shipowners' Radio Service:

Atlanta of Texas.
 Eastern Dawn.
 George E. Weed.
 Hanley.
 Jennie R. Morse.

Keshena.
 Lake Gatun.
 Maquan.
 Narcissus.
 Natirar.

Peacock.
 Storm King.
 Topa Topa.
 West Kebar.

The stations of the following-named vessels are operated and controlled by the Radio Corporation of America:

City of Weatherford.	Lake Blanchester.	Westward Ho.
Eastern Ocean.	Lehigh.	Wolverine State.
Edgewood.		

The station of the following-named vessel is operated and controlled by the Independent Wireless Telegraph Co.:

Abraham Lincoln.

Strike out all particulars of the following-named vessels:

Anyox.	Joan of Arc.	Manuel Rionda.
Hamilton.	Lakeside Bridge.	Nemassa.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDBX, *read* Mount Clay; KDEM, *read* Baytown; KDKR, *read* Warbler; KDKS, *read* Willett; KEQP, *read* Lake Festina; KEZ, *read* San Lorenzo; KLQ, *read* Rainbow, Mont. (near Great Falls); KQP, *read* Mount Sidney; KURK, *read* Fleetco; WGW, *read* Mount Sterling; WNQ, *read* Frederic Ewing. Strike out all particulars following the call signals KEQL, KETV, KOA, KONF. KUXX, and WCJ.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920.]

Morris Island, S. C.—Call letters changed from NAO to NZV.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

Rockville Center, N. Y. (2ZL).—Strike out all particulars.

MISCELLANEOUS.

WIRELESS ON ITALIAN VESSELS.

"Lloyds List" weekly summary, for December 31, 1920, published the following:

The "Official Gazette" publishes a decree ordering all motor and sailing vessels of over 1,600 tons and carrying passengers to be supplied with wireless installations.—Reuter. Rome, December 27, 1920.

OPERATOR'S LICENSE SUSPENDED.

License No. 18115 issued at Seattle, Wash., August 18, 1919, has been canceled on account of the holder using the license before the radio inspector had signed it.

RATES FOR SWEDEN.

The following information has been received from the Berne International Bureau:

Beginning January 1, 1921, the ship charge for Swedish stations will be 40 centimes per word with a minimum charge of 4 fr. per radiotelegram.

Also, the two first charges indicated in note 44, page 339, of the Official Nomenclature of radiotelegraph stations will be, respectively.

40 centimes and 4 fr. On the other hand, the telegraphic charges under Sweden, B, page 354, and relating to radiotelegrams exchanged with Denmark and Norway will be raised beginning the same date as follows:

- a—up to 10 words 1 fr. 96 centimes.
- b—for each additional word 14 centimes.

For urgent radiotelegrams these last two charges will be trebled.

RATES FOR NORWAY.

Beginning January 1, 1921, the coast charges for stations of Bergen, Flekkeroy, Rost, Sorvaagen, Tjome, and Utsire radio stations will be 40 centimes per word, with a minimum charge of 4 fr. per radiotelegram.

RATES FOR DENMARK.

Beginning January 1, 1921, the coast charges for Danish stations will be 40 centimes per word, with a minimum charge of 4 fr. per radiotelegram.

STRAITS SETTLEMENTS.

The British administration informs us that beginning January 1, 1921, the coast charge for the Penang and Singapore radio stations will be 60 centimes per word.

OPERATOR FINED.

An amateur operator in the third radio district has been recently fined, for violation of section 1 of the act of August 13, 1912, in that he failed to obtain a station and an operator's license.

OPERATOR'S LICENSE SUSPENDED.

License No. 20502 issued at New York, N. Y., November 22, 1919, was suspended for three months, beginning December 13 last, for violation of Article VI of the International Convention.

HEADQUARTERS PORT OF EIGHTH DISTRICT CHANGED.

The headquarters port of the eighth radio district has been changed from Cleveland, Ohio, to Detroit, Mich. This change should be made in the "Radio Communication Laws of the United States." All communications for the radio inspector in this district should be addressed to the Federal Building, Detroit, Mich.

INCREASED RATE FOR NEW YORK STATION OF RADIO CORPORATION OF AMERICA.

Effective February 1, this year, the New York station of the Radio Corporation of America, located at 47 West Street, call letters WNY, will charge 10 cents per word for ship service, in lieu of the previous rate which was 6 cents per word.

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APR 22 1922

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, March 1, 1921—No. 47

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name = Name of station.
- G. loc. = Geographical location: O=west longitude, N=north latitude, S=south latitude.
- Call = Call letters assigned.
- System = Radio system used and sparks per second.
- Range = Normal range in nautical miles.
- W. L. = Wave lengths assigned: Normal wave lengths in italics.
- Service = Nature of service maintained:
 - PG=General public.
 - PR=Limited public.
 - P =Private.
 - O =Government business exclusively.
- Hours =Hours of operation:
 - N =Continuous service.
 - X =No regular hours.
 - m =a. m. (12m=midday).
 - s =p. m. (12s =midnight).
- Rates =Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
- I. W. T. Co.=Independent Wireless Telegraph Co.
- R. C. of A. =Radio Corporation of America.
- S. O. R. S. =Ship Owners Radio Service.
- Co. =Company.
- Corp. =Corporation.
- & =And.

NEW STATIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Cleveland, Ohio ¹	KDPDM	300, 330, 500, 600.	P	X	Westinghouse Electric & Mfg. Co.
Detroit, Mich. ²	KDPH	300, 400, 600, 1625.	PR	X	Detroit-Edison Co.
East Moriches, N. Y. ³	WBC	300, 450, 600.....	PG	N	I. W. T. Co.
Port Huron, Mich. ⁴	KDPJ	300, 400, 500, 600 1625.	PR	X	Detroit-Edison Co.
Superior, Mich. ⁵	KDPI	800, 500, 600, 1625.	PR	X	Do.

¹ Loc. (approximately), 0 81° 44' 00", N. 41° 55' 00"; system, continuous wave phone; range, 100; rates none. Wireless telephone station for inland communication only.

² Loc., 0 83° 03' 40", N. 42° 20' 05"; range, 100; system, DeForest; rates, none. Wireless telephone station.

³ Loc., 0 72° 46' 05", N. 40° 48' 00"; range, 250; system, Marconi, 1000; rates, ship service 10 cents per word.

⁴ Loc., 0 82° 25' 33", N. 42° 47' 33"; range, 75; system, DeForest; rates, none. Wireless telephone station.

⁵ Loc., 0 83° 38' 27", N. 42° 15' 44"; range, 40; system, General Electric Co.; rates, none. Wireless telephone station.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Agwistar.....	KDPO	.....	.....	PG	N	Atlantic, Gulf & West Indies Lines.	I. W. T. Co.
America.....	KDOW	4	4	PG	X	U. S. Mail S. S. Co.....	R. C. of A.
Arden.....	KDPN	4	4	PG	X	U. S. S. B.....	
Franklin.....	KDPK	.....	.....	PG	X	Galena Navigation Co.	Do.
Gargoyle.....	KDPE	.....	.....	PG	X	Vacuum Oil Co.....	
Granite State.....	KDOZ	4	4	PG	N	U. S. S. B.....	Transmarine Corp.
Independent.....	WPI	.....	.....	.....	.....	National Independent Fisheries Co.	
Kennecott.....	KDPP	.....	.....	.....	.....	.....	Do.
Liebre.....	KDPG	.....	.....	PG	X	General Petroleum Corp.	
Livingstone.....	KDOY	.....	.....	PG	X	Tri-State S. S. Co.....	Do.
Mauna Kea.....	KDPD	4	4	PG	X	Inter-Island Steam Navigation Co.	
Pocahontas.....	KDOX	4	4	PG	.....	U. S. Mail S. S. Co.....	Do.
Silver State.....	KDPA	4	4	PG	N	U. S. Shipping Board.	
Suspearco.....	KDPC	.....	.....	PG	X	Submarine Boat Corp.	Transmarine Corp.
Swiftstar.....	KDPF	4	4	PG	X	U. S. Shipping Board.	
Tuxpanoil.....	KDPQ	.....	.....	PG	X	.....	Do.
Walter Jennings.....	KDPL	.....	.....	PG	N	Standard Oil Co. of New Jersey.	

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDOW	America.....b	KDPI	Superior, Mich.....c
KDOX	Poosahontas.....b	KDPJ	Port Huron, Mich.....c
KDOY	Livingstone.....b	KDPK	Franklin.....c
KDOZ	Granite State.....b	KDPL	Walter Jennings.....c
KDFA	Silver State.....b	KDPM	Cleveland, Ohio.....c
KDPC	Susquehanna.....b	KDPN	Arden.....c
KDPD	Madna Kee.....b	KDPO	Agawistaw.....b
KDPE	Gargyle.....b	KDPP	Kennecott.....b
KDPF	Swiftstar.....b	KDPQ	Tuxpanoff.....b
KDPG	Liebre.....b	WBC	East Moriches, N. Y.....c
KDPH	Detroit, Mich.....c	WPI	Independent.....b

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Fort Benjamin Harrison, Ind.....	WZAE	War Department.
Fort Howard, Md.....	WZAC	Do.
Fort Mason, Calif.....	WZAH	Do.
Fort McPherson, Ga.....	WZAD	Do.
Fort Omaha, Nebr.....	WZAG	Do.
Fort Sheridan, Ill.....	WZAF	Do.
Fort Wood, N. Y.....	WZAB	Do.
Minneapolis, Minn.....	KDPB	Post Office Department.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Captain Clarence M. Condon.....	WYBY	Major Lester E. Moreton.....	WYBU
Capt. Edward P. Nones.....	WYBP	Major William P. Pence.....	WYBW
Captain Edwin C. Long.....	WYBO	Lieut. Harold G. Douglas.....	WYBQ
Captain Fred L. Perry.....	WYBN	Lt. Col. Herman C. Schumm.....	WYBS
Captain Samuel C. Cardwell.....	WYBM	Lt. Col. Robert C. Gildart.....	WYBR
Colonel Albert Todd.....	WYBI	Melvin.....	NURC
Col. Garland N. Whistler.....	WYBJ	Poe.....	WYBL
Colonel George F. E. Harrison.....	WYBE	V-1.....	NICQ
General Absalom Baird.....	WYBA	V-2.....	NICR
General J. Franklin Bell.....	WYBB	V-3.....	NICS
Col. John V. White.....	WYBK	V-4.....	NICT
General Edmund Kirby.....	WYBF	V-5.....	NICV
General John P. Story.....	WYBH	V-6.....	NICX
General Wallace F. Randolph.....	WYBG	V-7.....	NICZ
Major Albert G. Jenkins.....	WYBV	V-8.....	NIDD
Major Carl A. Lohr.....	WYBT	V-9.....	NIDJ
Major John W. McKie.....	WYBX		

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
KDPB	Minneapolis, Minn. ....c	WYBW	Major William P. Pence.....b
WYBA	General Abesalom Baird.....b	WYBX	Major John W. McKie.....b
WYBG	General Wallace F. Randolph...b	WYBY	Captain Clarence M. Condon...b
WYBH	General John P. Story.....b	WZAB	Fort Wood, N. Y. ....c
WYBB	General J. Franklin Bell.....b	WZAC	Fort Howard, Md. ....c
WYBE	Colonel George F. E. Harrison...b	WZAD	Fort McPherson, Ga. ....c
WYBF	General Edmund Kirby.....b	WZAE	Fort Benjamin Harrison, Ind. .c
WYBI	Colonel Albert Todd.....b	WZAF	Fort Sheridan, Ill. ....c
WYBJ	Col. Garland N. Whistler.....b	WZAG	Fort Omaha, Nebr. ....c
WYBK	Col. John V. White.....b	WZAH	Fort Mason, Calif. ....c
WYBL	Poe.....b	NICQ	V-1.....b
WYBM	Capt. Samuel C. Cardwell.....b	NICH	V-2.....b
WYBN	Captain Fred L. Perry.....b	NICS	V-3.....b
WYBO	Captain Edwin C. Long.....b	NICT	V-4.....b
WYBP	Capt. Edward P. Nones.....b	NICV	V-5.....b
WYBQ	Lieut. Harold G. Douglas.....b	NICX	V-6.....b
WYBR	Lt. Col. Robert C. Gildart.....b	NICZ	V-7.....b
WYBS	Lt. Col. Herman C. Schumm.....b	NTDD	V-8.....b
WYBT	Major Carl A. Lohr.....b	NIDJ	V-9.....b
WYBU	Major Lester E. Moreton.....b	NURC	Melvin.....b
WYBV	Major Albert G. Jenkins.....b		

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

CAMOTES, P. I.—Strike out all particulars.

NEW ORLEANS, LA.—System, composite, 1000; service, P, PR, and PG; rates, for PR service, without minimum:

	Per word.
All points in British Honduras.....	35c.
Bluefield, Nicaragua.....	45c.
Bocas del Toro, Panama.....	55c.
Burwood, La.....	10c.
All points in Costa Rica.....	50c.
Swan Island.....	25c.

NEW YORK, N. Y. (WSE).—Range, 300–400; system, Independent arc and composite, 1000; w. l., 300, 450, 600, 1800.

SIASCONSET, MASS.—Rate, 10 c per word, which includes both station rate and the cable connecting the main land.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAME OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

A. A. DAUGHERTY.—Range, 150; system, Cutting & Washington, 1000; w. l., 300, 450, 600; rate, 8 c per word for all classes of service; station operated and controlled by Cutting & Washington Radio Corp.

ADMIRAL SCHLEY.—Range, 150; system, Marconi, 1000.

AEOLUS.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 600.

ANGELES.—Correct name *The Angeles*.

ANN ARBOR No. 4.—Range, 150; system, Marconi, 1000.

BELLA.—Range, 200; system, Marconi, 120; w. l., 300, 600; service, PG; hours, X; Bella S. S. Co. owner of vessel; station operated and controlled by owner of vessel; rate 4 c per word for all classes of service.

BIDWELL.—Range, 100–1000; system, Federal arc; w. l., 300, 450, 600, 1800.

CARLTON.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.

CHARLES H. CRAMP.—Range, 500; system, Federal arc; w. l., 300, 600, 1800; hours, X.

CHARLIE WATSON.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; rates, 4 c per word for all classes of service; station operated and controlled by R. C. of A

- CHESTER KIWANIS.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
 CHINA ARROW.—Range, 300; system, Marconi, 1000; w. l., 300, 600; hours, X
 station operated and controlled by R. C. of A.
 CITY OF RENO.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
 CITY OF WEATHERFORD.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300,
 450, 600.
 COLLINGSWORTH.—Range, 300; system, Wireless Specialty Apparatus Co., 1000;
 w. l., 300, 450, 600.
 CONCORD.—Range, 75; system, International Radio Telegraph Co.
 CONEHATTA.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000;
 w. l., 300, 450, 600.
 COOLCHA.—Anglo-California Trust Co. owner of vessel.
 COSKATA.—Range, 300; system, Navy-Wireless Improvement Co.; w. l., 300, 450, 600.
 CRAMPTON ANDERSON.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600;
 rate, 4 c per word for all classes of service; station operated and controlled by
 R. C. of A.
 CREOLE STATE.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
 CUYAMACA.—Range, 200; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600.
 DERBLAY.—Range, 200; system, Navy-Simon, 1000; w. l., 300, 450, 600.
 DULCINO.—Range, 150; system, Marconi, 1000; w. l., 300, 450, 600.
 EAST CAPE.—System, Navy-Wireless Specialty Apparatus Co., w. l., 300, 450, 600;
 hours, X.
 EAST HAMPTON.—Range, 150; system, Navy-Simon, 1000; w. l., 300, 450, 600; service,
 PR, hours, X; rates, none.
 E. J. EARLING.—Range, 150.
 EL ISLEO.—Station operated and controlled by owner of vessel.
 ETHAN ALLEN.—Range, 100-1000; system, Federal arc; w. l., 300, 600, 800; hours, N.
 FIRTHCLIFFE.—Hours, X.
 F. J. LUCKENBACH.—W. l., 300, 450, 600.
 FREEPORT SULPHUR No. 6.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600.
 FRIEDA.—Range, 300; w. l., 300, 450, 600; rates, 4 c per word for all classes of service.
 GARGOYLE.—Name changed to Oswego.
 GEORGE E. WEED.—Range, 300; system, Federal arc, w. l., 300, 600, 1800.
 GOLDEN STATE.—Range, 150-1500; system, Navy-Simon, 1000, and Federal arc;
 w. l., 300, 450, 600, 1800.
 GOLD STAR.—Range, 100-1000; system, Federal arc; w. l., 300, 450, 600, 1800.
 GULF COAST.—Range, 150; system, Marconi, 480.
 HAGAN.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000.
 HANLEY.—Range, 500; system, Federal arc; w. l., 300, 600, 1800.
 HASLEHURST.—Range, 300; system, Navy-Liberty, 1000; w. l., 300, 450, 600.
 HAWKEYE STATE.—Range, 150-1000; system, Navy-Simon, 1000, and Federal arc;
 w. l., 300, 450, 600, 1800.
 HEBER.—Range, 300; system, Federal arc; w. l., 300, 600.
 HELEN.—Range, 300; system, I. W. T. Co. arc.
 HICKMAN.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600; hours, N.
 INDEPENDENT BRIDGE.—Range, 300; system, Navy, 1000; w. l., 300, 600.
 INDIA ARROW.—Hours, N.
 JAMES OTIS.—Range, 100-1000; system, Federal arc; w. l., 300, 600, 1800.
 JOHN ENGLISH.—Range, 100-1000; system, Federal arc; w. l., 300, 450, 600, 1800.
 JOHN STEVENS.—Range, 700; system, Federal arc, w. l., 300, 600, 1800.
 JOHN WORTHINGTON.—Standard Oil Co. of New Jersey owner of vessel.
 KINGFISHER (KDNJ).—System, I. W. T. Co., Andrew Hudson owner of vessel;
 station operated and controlled by I. W. T. Co.
 KYCHAK.—Range, 200; rates, transoceanic service 8 c per word.
 LAKE FLORAVISTA.—System, Navy-International Radio Telegraph Co., 1000; w. l.,
 300, 450, 600.
 LANCASTER.—System, Navy-Marconi, 1000; hours, X.
 LEXINGTON.—Range, 75; system, International Radio Telegraph Co.
 MARINERS HARBOR.—System, Navy, 1000.
 MARQUETTE and BESSEMER No. 2.—Range, 200; w. l., 300, 450, 600; service, PG.
 MARY LUCKENBACH.—Range, 300; system, Marconi, 1000; w. l., 300, 600; rates, 4 c
 per word for all classes of service; station operated and controlled by R. C. of A.
 MAZATLAN.—System, Marconi, 1000; w. l., 300, 450, 600.
 MERCER.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
 MERRY MOUNT.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.
 MINNESOTA (WEK).—George S. Bennett owner of vessel.
 MONO.—System, Navy, 1000.

MUNAMAR.—Range, 300; system, R. C. of A., 1000.
 MUNDALE.—Range, 150.
 MUNDELTA.—Range, 300; w. l., 300, 450, 600.
 NEW HAMPSHIRE.—Range, 75; system, International Radio Telegraph Co., 260.
 NORTHLAND (WGJ).—Rates, all classes of service, 4 c per word.
 OSSA.—System, Navy, 1000.
 OUTAGAMIE.—Standard Oil Co. owner of vessel.
 PEQUONNOCK.—Range, 75; system, International Radio Telegraph Co., 260.
 PHILIP PUBLICKER.—Publicker Shipping Co. owner of vessel.
 P. J. REILLY.—Range, 150; system, Cutting & Washington, 1000; w. l., 300, 450, 600; rates, North and South American service, 4 c per word; station operated and controlled by Cutting & Washington Radio Corp.
 PLYMOUTH (KXH).—Range, 75; system, International Radio Telegraph Co.
 POINT ADAMS.—Station operated and controlled by Federal Telegraph Co.
 POINT BONITA.—Range, 200; system, Kilbourne & Clark, 1000.
 POZNAM.—Range, 150; w. l., 300, 450, 600.
 PROVIDENCE.—Range, 75; system, International Radio Telegraph Co., 260.
 PURITAN.—Range, 150; system, Marconi, 1000.
 QUILLWACK.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600.
 RAINIER.—Atlas S. S. Co. owner of vessel.
 ROCKAWAY PARK.—System, Navy-Wireless Specialty Apparatus Co., 1000; hours, X.
 ROYAL ARROW.—Hours, X.
 SAN FRANCISCO.—Range, 300; w. l., 300, 450, 600.
 S. C. T. DODD.—Range, 300; system, Marconi, 1000; w. l., 300, 600; station operated and controlled by R. C. of A.
 SENATOR BAILEY.—System, I. W. T. Co., w. l., 300, 600.
 S. O. Co. No. 91.—Range, 150.
 SOCONY 94.—Range, 150.
 SPOKANE.—System, Marconi, 1000; w. l., 300, 450, 600.
 STRANDTOW No. 1.—Range, 150.
 STEEL RANGER.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; hours, X.
 SUDAWSONCO.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600; rates, all classes of service 4 c per word; station operated and controlled by Transmarine Corp.
 SUDBURY.—Range, 300; system, Marconi, 1000.
 SULANIERCO.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600; station operated and controlled by Transmarine Corp.
 SUSCOLANCO.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600; rates, all classes of service 4 c per word; station operated and controlled by Transmarine Corp.
 TOLOSA.—Range, 300; system, Navy, 1000; w. l., 300, 600.
 TUSCALOOSA CITY.—Range, 300; system, Marconi, 1000; w. l., 300, 600; hours, X; station operated and controlled by R. C. of A.
 WESTERN PLAINS.—System, Navy; 1000; w. l., 300, 450, 600.
 WOLVERINE STATE.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600; station operated and controlled by R. C. of A.
 YAPALAGA.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.

The stations of the following-named vessels are operated and controlled by the Independent Wireless Telegraph Co.:

Everglades.	Lake Clear.	Vanada.
Gulfling.	Potter.	Yorba Linda.
Heffron.	Storm King.	York Harbor.

The stations of the following-named vessels are operated and controlled by the Shipowners' Radio Service:

District of Columbia.	Naamhok.	West Apaum.
Golden State.	Nacata.	West Cusseta.
Hawkeye State.	Namaasket.	West Notus.
James Otis.	Warwick.	

The stations of the following-named vessels are operated and controlled by the Radio Corporation of America:

Gdansk.	Storm King.	Terre Haute.
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Strike out all particulars of the following-named vessel:

City of Topeka.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KRK, *read* Oswego; KUJB, *read* The Angeles; WIE, *read* Edward L. Doheny; WIF, *read* Herbert G. Wylie. Strike out all particulars following the call signals KDMW and WGY.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920.]

BRAUFORT, N. C.—*Read* Moorehead City, N. C.
BOSTON, MASS.—Call signal changed to WZAA.
TAMPA, FLA.—*Read* St. Petersburg, Fla.

Strike out all particulars of the following named stations:

Anderson (permanently moored vessel at Fortress Monroe).
Buckroe (permanently moored vessel at Fortress Monroe).
FORT WOOD, N. Y.
HILLCREST, CALIF.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920.]

CYRUS W. FIELD.—Call signal changed to WYBC.
FAHRENHOLT.—Correct name Farenholt.
GENERAL WILLIAM M. GRAHAM.—Call signal changed to WYBD.

Strike out all particulars of the following-named vessels:

Favorite.	S. P. 156 (Winchester).	U-B-88.
Gypsum Queen.	Sylvia.	U-C-97.
Nopatin.	U-111.	W. A. Edwards.
Samar.	U-117.	W. J. Courtney.
S. C. 289.	U-148.	

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NAN, *read* Moorehead City, N. C.; NEOK, *read* Farenholt; NGL, *read* St. Petersburg, Fla.; WEY, *read* WYBD; WXH, *read* WZAA; WXS, *read* WYBC. Strike out all particulars, NAJN, NAKO, NAMQ, NARQ, NCJ, NDT, NEQP, NERD, NESD, NEVG, NEXK, NLX, NOSS, NPG, NUKS, WUM, WZL, WZM.

MISCELLANEOUS.

CHANGE IN THE METHOD OF LICENSING COMMERCIAL RADIO OPERATORS AS APPROVED BY HON. J. W. ALEXANDER, SECRETARY OF COMMERCE, FEBRUARY 12, 1921.

Licenses to radio operators after June 30, 1921, will certify to—first, efficiency in radio communication (class); second, duration and quality of service (grade).

EFFICIENCY.

The standards of efficiency established by international conventions are as follows:

First class (Article X, Radio Convention 1912).—(a) Adjustment of the apparatus and knowledge of its functioning.

(b) Transmission and acoustic reception at the rate of not less than 20 words a minute.

(c) Knowledge of the regulations governing the exchange of radio correspondence.

Second class (Article X, Radio Convention, 1912).—Ability to transmit and receive at a rate of only 12 to 19 words a minute but who, in other respects, fulfill the requirements mentioned above.

Watchers' class (Article XXXV, Safety at Sea Convention, 1914).—Ability to receive and understand the radiotelegraph distress signal and the safety signal.

Extra first class.—In addition to these the Department of Commerce will continue the issue of licenses certifying to—

(a) Adjustment of the apparatus and knowledge of its functioning.

(b) Transmission and acoustic reception at the rate of not less than 30 words per minute, Continental Morse, and 25 words per minute, American Morse (five letters to the word).

(c) Knowledge of the regulations governing the exchange of radio correspondence which will be designated commercial extra first class.

SERVICE.

Hitherto the duration and quality of service has been shown by the indorsements on the license of the operator. These indorsements will be made as heretofore, and license of the several classes above enumerated will be graded also as follows:

Third grade.—Less than 6 months satisfactory commercial service and a speed of 12 words a minute.

Second grade.—Six months or more satisfactory commercial service in the third grade and a speed of 20 words a minute.

First grade.—A year or more satisfactory commercial service in the second grade and a speed of 25 words a minute.

Satisfactory service as an operator in any branch of the Federal service shall be deemed equivalent to like commercial service.

OUTSTANDING LICENSES.

Outstanding licenses will be valid until they expire when the renewal will show the grade to which the operator is entitled.

CHANGE IN RATES FOR BELGIAN CONGO.

The charges in part 3 of the nomenclature, applicable to radiotelegrams originating in or intended for Belgian Congo and exchanged directly with the coast stations of that country, have been modified as follows:

	Radiotelegrams.	
	Ordinary.	Urgent.
A—Offices served by land lines: Bolobo, Boma, Coquilhatville, Gombe, Kinshasa, Kwamouth, Leopoldville, Lukolela, Lukula, Madimba, Matdi, Thysville.	0.30 fr. per word...	0.60 fr. per word.
B—Other offices.....	0.50 fr. per word...	1 fr. per word.

CHANGE IN RATES FOR DUTCH EAST INDIES.

The coast stations of Balikpapan and Tarakan radio are now open to general public service.

Beginning February 1, the charge for radiotelegraphic coast stations in the Dutch East Indies, with the exception of Soerabaja, is 0.80 franc per word, with a minimum charge of 8 francs per radiotelegram.

Finally, the table of inland charges of the Dutch East Indies figuring in part 3 of the nomenclature is to be completed in the following manner:

	Radiotelegrams.	
	Ordinary.	Urgent.
F and G—Radiotelegrams transmitted by the Balikpapan and Tarakan radio coast stations and originating at or intended for the following offices:		
Balikpapan.....	0.20 fr. per word, minimum 1 fr.	0.60 fr. per word, minimum 3 fr.
Amoental, Bandjermasin, Hajoep, Kotabaro, Poeloe Laet, Pegatan, Samarinda, Stagen, and Tanah Grogot.	0.40 fr. per word, minimum 2 fr.	1.20 fr. per word, minimum 6 fr.
All other offices.....	0.80 fr. per word, minimum 4 fr.	2.40 fr. per word, minimum 12 fr.

CHANGE IN RATES FOR ITALY.

Beginning February 1, the charge of the Italian radiotelegraphic coast stations is raised from 0 franc 30 per word to 0 franc 60 per word.

Beginning the same date, the charges indicated in part 3 of the nomenclature, applicable to the ordinary radiotelegrams originating at or intended for Italy and exchanged directly with the coast stations of Italy are as follows:

Ordinary radiotelegrams.—0 franc 25 per word, with a minimum charge per radiotelegram of 2 francs.

Urgent radiotelegrams.—0 franc 75 per word, with a minimum charge of 6 francs per radiotelegram.

SPECIAL CALL SIGNALS.

The call signal KSBV has been assigned as a general call for all United States Shipping Board vessels, and call signal KSOC has been assigned as a general call for all vessels owned by the Standard Oil Co. of New Jersey.

OPERATORS REQUESTED TO REPORT WEATHER CONDITIONS.

The cooperation of naval and merchant vessels is requested in furnishing certain information in regard to weather conditions in the vicinity of the United States naval air station, Coco Solo, Panama, Canal Zone, which information is desired for the protection of aviators flying from that station, especially in view of the many long-distance flights undertaken in that vicinity.

With this purpose in view it is requested that every vessel within radio touch of either "Radio Colon" or "Radio Balboa" will forward

via either one of the foregoing radio stations, to "Radio Coco Solo," at 7 a. m. and 4 p. m., seventy-fifth meridian mean time, her position (latitude and longitude), local barometric pressure, local temperature, local wind velocity and direction, state of sea, and kind and quantity of clouds.—From *Hydrographic Bulletin*, Feb. 2, 1921.

CAPE MAY RADIO (COMPASS) STATION RELOCATED.

The United States radio compass station at Cape May, N. J., will be relocated in latitude $38^{\circ} 56' N.$, longitude $74^{\circ} 54' 34'' W.$, and bearings will be transmitted from this new location beginning March 1, this year.—From *Hydrographic Bulletin*, Feb. 16, 1921.

INTERNATIONAL ICE OBSERVATION AND ICE PATROL SERVICE.

For the purpose of carrying on the International Ice Observation and Ice Patrol Service provided for by the International Convention for the Safety of Life at Sea, London, 1913-14, the U. S. Coast Guard cutter *Seneca* has been detailed for this service and will leave New York about February 15, proceeding to the Grand Banks of Newfoundland to locate the ice fields and positions of the icebergs; keeping in touch with the situation; making such observations as practicable on the quantities of ice, its kind, extent, and drift; and obtain any other information that may seem to be of value.

The object of the patrol is primarily to ascertain the location and progressive movement of the limiting lines of the regions in which icebergs and field ice exist in the vicinity of the Grand Banks of Newfoundland and the dissemination of the information so ascertained for the guidance and warning of navigators, and coordinately with these primary duties, in making oceanographical and meteorological observations as will form a contribution toward the knowledge of the causes why the limiting lines assume their observed locations.

During the period of ice observations the *Seneca* will be the only vessel employed on this duty, but when the ice has moved southward so as to make a constant patrol necessary, an additional vessel will be detailed for that purpose. The experience of previous years has shown that a continuous ice patrol should be established about April 1 and should continue throughout the season of dangerous ice conditions.

Upon getting in touch with the ice the *Seneca* will send a report daily to the Branch Hydrographic Office, New York City, at 4 a. m., seventy-fifth meridian time, addressed "Hydrographic, New York." An endeavor will be made to communicate the message direct to coast radio stations. If unable to communicate with any of these stations the message will be relayed through any vessel within reach.

The ice information will be given in as plain and concise English as practicable, and will state the following:

- (a) Ice (berg or field).
- (b) Date.
- (c) Time (seventy-fifth meridian).
- (d) Latitude.
- (e) Longitude.
- (f) Other data as may be necessary.

While on this duty the patrol vessel will endeavor by means of daily radio messages to keep ships at sea advised of the limits of the ice fields, etc.

The *Seneca's* radio call letters are NRE. She will use a wave of 600 meters when communicating with passing vessels.

The radio messages from the patrol ships will be given publicity immediately upon their receipt by the Branch Hydrographic Office, New York, and by the Hydrographic Office, Washington, D. C.—From *Hydrographic Bulletin*, Feb. 16, 1921.

FADING TESTS DISCONTINUED.

The fading tests conducted by the Bureau of Standards having been completed, the special wave lengths assigned to amateur stations engaged in the test are withdrawn and their use must be discontinued.

OPERATOR'S LICENSE SUSPENDED.

First-grade license, No. 15588, issued at Norfolk, Va., September 26, 1919, has been suspended for a period of three months on account of the holder of the license violating Article VI of the International Convention, in that he caused superfluous signals to be transmitted.

LOST COMMERCIAL RADIO OPERATORS' LICENSES.

Printed below is a list of radio operators' licenses which have been reported to this Bureau as having been lost. Should any of them be found, they should be returned to the Bureau for cancellation. Inspectors and others concerned should see that lost licenses are not being used by unauthorized persons.

Name.	Grade.	Number.	Date issued.	Port issued.
Abbott, J. Marroun.....	First.....	18259	Oct. 30, 1918	New York.
Bandettini, Attilio.....	do.....	17144	Feb. 2, 1920	Chicago.
Baron, Morris.....	do.....	20776	May 3, 1920	New York.
Berkowitz, A. C.....	do.....	22144	Aug. 4, 1920	Baltimore.
Brinsmade, Allan C.....	do.....	16254	Oct. 18, 1918	New Orleans.
Butler, Ralph E.....	Second.....	14134	Dec. 12, 1919	Seattle.
Cooper, Eldon D.....	First.....	19187	Oct. 2, 1919	New York.
Corbett, Raymond A.....	do.....	22143	Aug. 4, 1920	Baltimore.
Dale, Henry P.....	do.....	17891	July 14, 1919	New York.
Hopkins, F. M.....	do.....	13378	Aug. 12, 1919	Balboa.
Horstmeier, D. W.....	do.....	16889	June 12, 1919	San Francisco.
Hunt, John W.....	do.....	19047	Sept. 4, 1919	New York.
Kane, J. E.....	do.....	13093	Sept. 15, 1919	New Orleans.
Marsano, Ronald W. S.....	do.....	21964	May 10, 1920	Baltimore.
Misel, Julius.....	do.....	19936	Jan. 17, 1920	Do.
Mullen, Rupert.....	do.....	17300	May 1, 1920	Cleveland.
Mulvihill, John L.....	Second.....	15773	Jan. 10, 1920	New York.
Patton, Archie F.....	First.....	22231	Nov. 20, 1920	Baltimore.
Shapiro, Geo. J.....	do.....	19502	Aug. 19, 1919	Do.
Sherlog, John L.....	do.....	19364	Jan. 15, 1920	New York.
Tong, Myron A.....	do.....	18468	Apr. 14, 1919	Do.
Tyler, Edmond B.....	do.....	23457	May 19, 1920	Do.
Walsh, Thos. F.....	do.....	21861	Mar. 25, 1920	New Orleans.

HEADQUARTERS PORT OF EIGHTH DISTRICT CHANGED.

The headquarters port of the eighth radio district has been changed from Cleveland, Ohio, to Detroit, Mich. This change should be made in the "Radio Communication Laws of the United States." All communications for the radio inspector in this district should be addressed to the Federal Building, Detroit, Mich.

DESIGNATING LETTER ASSIGNED TO FEDERAL TELEGRAPH CO.

Referring to the list of companies and the designating letters assigned to them which appeared in Radio Service Bulletin No. 45 the Federal Telegraph Company should be added to the list as having designating letter "F."

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ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, May 2, 1921—No. 49

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name =Name of station.
 G. loc. =Geographical location: O=west longitude, N=north latitude, S=south latitude.
 Call =Call letters assigned.
 System =Radio system used and sparks per second.
 Range =Normal range in nautical miles.
 W. L. =Wave lengths assigned: Normal wave lengths in italics.
 Service =Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P =Private.
 O =Government business exclusively.
 Hours =Hours of operation:
 N =Continuous service.
 X =No regular hours.
 m =a. m. (12 m=midday).
 s =p. m. (12s=midnight).
 Rates =Ship or coast charges in cents; c=cents. (The rates in the international list are given in francs and centimes.)
 I. W. T. Co.=Independent Wireless Telegraph Co.
 R. C. of A.=Radio Corporation of America.
 S. O. R. S.=Ship Owners' Radio Service.
 Co. =Company.
 Corp. =Corporation.
 & =And.
 Do. =Ditto.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Amuguis, P. I.....	KDRF	300, 450, 600	PG	N	Philippine Insular Government.
Chatham, Mass. ¹	WCC	300, 450, 600	PG	N	R. C. of A.
New Brunswick, N. J. ²	WNY	300, 450, 600	PG	N	Do.
Nixon Fork, Alaska ³	KDRY	300, 600, 1650	PR	X	Alaska Treadwell Gold Mining Co.
Ruby (permanently moored scow in Alaska). ⁴	KDRH	300, 400, 600	PR	X	Alaska Packers Association.
San Francisco, Calif. ⁵	KDRO	300, 450, 600, 1605	PR	X	Bethlehem Shipbuilding Corp.

¹ Loc. (approximately) 0.70° 00' 00", N. 41° 42' 00"; range, 350; system, General Electric Co.; rates, ship service 10c. per word.

² Loc. 0.74° 29' 15", N. 40° 30' 10"; range, 250; system, R. C. of A., 120-240; rates, ship service 10c. per word.

³ Loc. (approximately) 0.155° 30' 00", N. 62° 53' 00"; range, 300; system, Marconi, 430; rates, none.

⁴ Loc. (approximately) 0.157° 02' 00", N. 53° 50' 00"; range, 15; system, Halcun; rates, none.

⁵ Loc. 0.122° 23' 07", N. 37° 45' 15", range, 100; system, composite; rates, none.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		Cents.	Cents.				
Aeropolls.....	KDRI	.....	.....	PG	X	Stephen D. Stephenidis.	
Agwihavre.....	KDRX	4	4	PG	X	Atlantic, Gulf & West Indies S. S. Lines.	I. W. T. Co.
Agwismith.....	KDRC	4	4	PG	N	do.	Do.
Argus ¹	KUVD	4	4	PG	X	U. S. Shipping Board.	S. O. R. S.
Buckeye State.....	KDRW	4	4	PG	N	do.	
Centennial State.....	KDRL	4	4	PG	N	do.	
Cuba.....	KDRT	.....	.....	PG	N	Peninsular & Occidental S. S. Co.	
Delphine.....	KDRR	.....	.....	.....	.....	Horace E. Dodge estate.	
E. W. Sinclair.....	KDRN	8	8	PG	X	Sinclair Navigation Co.	R. C. of A.
Henry D. Whiton.....	KDRM	.....	.....	PG	X	Union Sulphur Co.	
K. R. Kingsbury ²	KDRE	8	8	PG	X	Standard Oil Co. of Calif.	Do.
Luzon.....	KDRU	.....	.....	.....	.....	Fernandez Hermanos.	
Manulani.....	KDRQ	.....	.....	PG	N	Matson Navigation Co.	
Mindoro.....	KDRS	.....	.....	.....	.....	Philippine Insular Government.	
Mount Clinton.....	KDRV	.....	.....	PG	N	Shawmut S. S. Co.	
R. J. Hanna ²	KDRD	8	8	PG	X	Standard Oil Co. of Calif.	R. C. of A.
Selma City.....	KDRJ	8	8	PG	N	U. S. Steel Products Co.	Do.
Suphenco.....	KDRP	.....	.....	PG	X	Submarine Boat Corp.	
Swift Eagle.....	KDRK	4	4	PG	X	U. S. Shipping Board.	
Vancolite.....	KDRG	.....	.....	PG	N	Standard Oil Co. of N. J.	

¹ Range, 200; system, Navy-Kilbourne & Clark, 1000; w. l., 300, 600.

² Range, 300; system, R. C. of A., 1000; w. l., 300, 600.

Commercial land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDRC.	Agwismith.....b	KDRP.	Syphenco.....b
KDED.	R. J. Hanna.....b	KDRQ.	Manulani.....b
KDBE.	K. R. Kingsbury.....b	KDRF.	Delphine.....b
KDRF.	Amuguis, P. I.....c	KDRS.	Mindoro.....b
KDRG.	Vancouver.....b	KDRT.	Cuba.....b
KDRH.	Ruby (permanently moored scow).....c	KDRU.	Luzon.....b
KDRI.	Acropolis.....b	KDRV.	Mount Clinton.....b
KDRJ.	Selma City.....b	KDRW.	Buckeye State.....b
KDRK.	Swift Eagle.....b	KDRX.	Agwihavre.....b
KBRL.	Centennial State.....b	KDRY.	Nixon Fork, Alaska.....c
KDRM.	Henry D. Whiton.....b	KUVD.	Argus.....b
KDRN.	E. W. Sinclair.....b	WCC.	Chatham, Mass.....c
KDRO.	San Francisco, Calif.....c	WNY.	New Brunswick, N. J.....c

Government land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Amagansett, N. Y. ¹	NBM	U. S. Navy Department.
Lakehurst, N. Y. ¹	NEL	Do.

¹ Radio compass station.*Special land stations, alphabetically by names of stations.*

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, only.]

Station.	Call signal.	Station controlled by—
Alliance, Ohio.....	8YT	Mount Union College.
Austin, Tex.....	5ZAG	George E. Endress.
Baltimore, Md.....	3ZU	Southern Wireless Institute.
Biloxi, Miss.....	5ZAH	Hubert S. Ogden.
Bloomington, Ind.....	9YAG	Indiana University.
Casper, Wyo.....	7ZO	Norman R. Hood.
Cincinnati, Ohio.....	8YX	University of Cincinnati.
Cleveland, Ohio.....	8XV	Frederick S. McCullough.
Corvallis, Oreg.....	7YJ	Oregon Agricultural College.
Dayton, Ohio.....	8YU	Young Men's Christian Association.
Denver, Colo.....	9XAG	Harry H. Buckwalter.
Easton, Pa.....	3YO	Lafayette College.
Ellendale, N. Dak.....	9ZX	H. J. Goddard and E. S. Leavenworth.
Norristown, Pa.....	3ZV	Samuel W. Place.
Oakland, Calif.....	6XAF	Pacific Telephone & Telegraph Co.
Peoria, Ill.....	9XAF	Bradley Institute.
Portland, Oreg.....	7YH	Washington High School.
San Antonio, Tex.....	5ZAE	Leavell D. Wall.
San Francisco, Calif.....	6XAE	The Radio Telephone Shop.
San Jose, Calif.....	6ZAA	E. Garratt Arnold.
Seattle, Wash.....	7XJ	Charles W. Peterson.
Springfield, Ohio.....	8ZAA	J. Warren Wright.
Thibodaux, La.....	5YL	Thibodaux High School.
Villanova, Pa.....	3YP	Villanova College.
Waco, Tex.....	5ZAF	William P. Clarke.
Washington, D. C.....	3YL	Knights of Columbus Service School.

Special land stations grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
3YL	Third district:	7XJ	Seventh district:
3YO	Washington, D. C.	7YH	Seattle, Wash.
3YP	Easton, Pa.	7YJ	Portland, Oreg.
3ZU	Villanova, Pa.	7YJ	Corvallis, Oreg.
3ZV	Baltimore, Md.	7ZO	Casper, Wyo.
	Norristown, Pa.		Eighth district:
5YL	Fifth district:	8XV	Cleveland, Ohio.
5ZAE	Thibodaux, La.	8YT	Alliance, Ohio.
5ZAF	San Antonio, Tex.	8YU	Dayton, Ohio.
5ZAG	Waco, Tex.	8YX	Cincinnati, Ohio.
5ZAH	Austin, Tex.	8ZAA	Springfield, Ohio.
	Biloxi, Miss.		Ninth district:
6XAE	Sixth district:	9XAF	Peoria, Ill.
6XAF	San Francisco, Calif.	9XAG	Denver, Colo.
6ZAA	Oakland, Calif.	9YAG	Bloomington, Ind.
	San Jose, Calif.	9ZX	Ellendale, N. Dak.

ALTERATIONS AND CORRECTIONS.**COMMERCIAL LAND STATIONS.**

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

AKUTAN, ALASKA.—Range, 150.

BECHAROF, ALASKA.—Range, 200; system, Kilbourne & Clark, 120; w. l., 300, 500, 600.
BOLINAS, CALIF.—(KET) Location, 0. 122° 42' 30", N. 37° 54' 12"; range, 6000; w. l., 5860, 6700, 7020; rates, from Bolinas or San Francisco, Calif., to Kahuku or any point on the island of Oahu, Hawaii, 25c. per word; Government rate 12½c. per word; press rate 5c. per word. Lettergrams \$1 for the first 12 words and 8c. for each additional word; week-end lettergrams \$1.50 for the first 24 words and 6c. for each additional word. From Bolinas or San Francisco, Calif., to Japan 72c. per word; Government rate 36c. per word; press rate 27c. per word.

CHISIK ISLAND, ALASKA.—Range, 300; system, composite, 600; w. l., 300, 550, 600, 1650; service PR, hours, X; rates, none.

CLEVELAND, OHIO (WCX).—Range, 400; w. l., 300, 600, 1640, 2050; hours, 7 a. m.—9 p. m.

DETROIT, MICH.—W. l., 300, 600, 1850, 3062; hours, 7 a. m.—9 p. m.

FALSE PASS, ALASKA.—W. l., 300, 525, 600, 2000.

KAHUKU, HAWAII.—Range, 4000; w. l., 300, 600, 16435; service, PR; rates, from from Kahuku or any point on the island of Oahu to Bolinas or San Francisco, Calif., full rate 25c. per word, Government rate 12½c. per word; lettergrams \$1 for the first 12 words, 8c. for each additional word; week-end lettergrams \$1.50 for the first 24 words, 6c. for each additional word; press 5c. per word. From Kahuku to Japan 60c. per word.

KARLUK, ALASKA.—Range, 25; w. l., 300, 500, 600.

KING COVE, ALASKA.—In addition to rates previously reported—station to station 6c. per word, minimum 60c., domestic count.

KOGGIUNG, ALASKA (KUBX).—Range, 20; w. l., 300, 400, 600, hours, X.

KOGGIUNG, ALASKA (KVV).—Rates, 6c. per word, minimum 60c.

KUSSILOF, ALASKA.—Range, 200.

KVICHAK, ALASKA.—Range, 200.

KWIGUK SLOUGH, ALASKA.—Service, PG and PR; rates, ship service 6c. per word, no minimum; station to station 6c. per word, minimum 60c., domestic count; station to station (night message) 5c. per word, minimum 50c., domestic count; station to station (night letter) 60c. for 50 words and 12c. for each additional 10 words or fraction thereof.

LAZY BAY, ALASKA.—Hours, 8 a. m.—12 noon and 1–5 p. m., and such other times as may be necessary.

LIBBYVILLE, ALASKA.—Service, PG and PR.

METHA NELSON.—Range, 25; system, Marconi; w. l., 300, 400, 600.

NAKNEK, ALASKA.—Range, 300.

NEW YORK, N. Y. (WNY).—Strike out all particulars.

- NUSHAGAK, ALASKA.**—Location (approximately), 0. 158° 30' 00'', N. 59° 00' 00'', range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 600, 1600; service, PR; hours, X.
- PILOT POINT, ALASKA.**—Range, 200; system, Kilbourne & Clark, 1000; w. l., 300, 500, 600.
- PORT WALTER, ALASKA.**—W. l., 300, 500, 600; service, PG and PR.
- SNAG POINT, ALASKA.**—Range, 200.
- TELLER, ALASKA.**—Strike out all particulars.
- UYAK, ALASKA.**—Range, 300.
- WASHINGTON BAY, ALASKA.**—W. l., 300, 550, 600, 1650.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berns bureau.]

- ADMIRAL GOODRICH.**—Range, 300; w. l., 300, 450, 525, 600.
- ADMIRAL WATSON.**—Range, 300; w. l., 300, 550, 600.
- AGWISTAR (KDPO).**—Read Agwistone; range, 200; system, I. W. T. Co., 1000; w. l., 300, 450, 600; hours, X.
- ALADDIN.**—Range, 300; system, Marconi, 1000; w. l., 300, 600; rates, North and South American and transoceanic services 8c per word; station operated and controlled by R. C. of A.
- ALPENA.**—Range, 200.
- ANNAPOLIS.**—Range, 150; system, Marconi, 1000; service, PG; hours, X; rates, North and South American and transoceanic services 4c per word.
- ASTMAHCO III.**—Astmahco 3 (Inc.), owner of vessel.
- ASTMAHCO IV.**—Astmahco 4 (Inc.), owner of vessel.
- BESSEMER CITY.**—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; hours, X.
- BIRCHLEAF.**—U. S. Shipping Board owner of vessel.
- BRILLIANT.**—Range, 150.
- CAJACET.**—Name changed to Willsolo.
- CHARLES L. HUTCHINSON.**—Rates, Great Lakes 2c per word.
- CHINA.**—Range, 300.
- CITY OF BRUNSWICK.**—Station operated and controlled by R. C. of A.
- CITY OF PARA.**—Range, 200; system, Kilbourne & Clark, 1000; hours, N; rates, none for transoceanic service.
- CORSAIR.**—Station operated and controlled by owner of vessel.
- COTE BLANCHE.**—Range, 200; system, Navy, 1000.
- CARRIER.**—Rates, transoceanic 4c per word.
- EAGLE (KDBF).**—Station operated and controlled by owner of vessel.
- EASTERN ADMIRAL.**—Station operated and controlled by S. O. R. S.
- EASTERN TRADER.**—Station operated and controlled by I. W. T. Co.
- EL ORIENTE.**—Range, 150; hours, X.
- F. C. LATROBE.**—Range, 150; system, Marconi, 1000; service, PG; hours, X; rates, North and South American services 4c per word.
- FEARLESS.**—Range, 200; service, PG; hours, X; rates, North and South American service 4c per word; transoceanic 8c per word.
- FRANK G. DRUM.**—Associated Oil Co. owner of vessel.
- FRANKLIN.**—Range, 300; system, Westinghouse, 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services 8c per word; station operated and controlled by I. R. T. Co.
- FREDERIC EWING.**—Range, 150.
- GALVESTON.**—Station operated and controlled by I. W. T. Co.
- GRANSE.**—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
- GRANITE STATE.**—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600.
- GULFSTREAM.**—Range, 200; system, I. W. T. Co., 1000.
- GULFCOAST.**—Rates, North and South American and transoceanic services 4c per word; station operated and controlled by I. W. T. Co.
- GULFKING.**—Range, 200; system, I. W. T. Co., 1000; rates, North and South American and transoceanic services 4c per word.
- GULPLAND.**—Range, 200; system, I. W. T. Co., 1000; rates, North and South American and transoceanic services 4c per word.
- GULFLIGHT.**—System, I. W. T. Co., 1000; rates, North and South American and transoceanic services 4c per word; station operated and controlled by I. W. T. Co.
- GULFMAID.**—Rates, North and South American and transoceanic services 4c per word; station operated and controlled by I. W. T. Co.

- GULF OF MEXICO.**—Rates, North and South American and transoceanic services 4c per word; station operated and controlled by I. W. T. Co.
- GULFOIL.**—System, I. W. T. Co., 1000.
- GULF PRINCE.**—Rates, North and South American and transoceanic services 4c per word; Gulf Refining Co. owner of vessel; station operated and controlled by I. W. T. Co.
- GULF QUEEN.**—Range, 200; system, I. W. T. Co., 1000; rates, transoceanic 4c per word.
- GULFSTAR.**—Range, 200; system, I. W. T. Co., 1000; rates, North and South American and transoceanic services 4c per word.
- GULFSTREAM.**—Rates, transoceanic 4c per word.
- GULFTRADE.**—Range, 200; system, I. W. T. Co., 1000; rates, North and South American and transoceanic services 4c per word.
- IREQUOIS (KUTQ).**—Rates, Great Lakes service 2c per word.
- ITOMPA.**—Rates, transoceanic service 4c per word; U. S. Shipping Board owner of vessel.
- J. A. MOFFETT.**—Range, 300; w. l., 300, 600, 1800.
- JEFFERSON (KOD).**—W. l., strike out 450; hours, X; station operated and controlled by owner of vessel.
- JEFFERSON (WJ).**—Range, 250; w. l., 300, 550, 600.
- J. M. GUFFEY.**—System, I. W. T. Co., 1000; rates, North and South American and transoceanic services 4c per word.
- JUNIATA (KQJ).**—Range, 150.
- KERESAN.**—Name changed to Mount Seward.
- LAKE ENNIS.**—Station operated and controlled by R. C. of A.
- LAKE FARBER.**—Station operated and controlled by I. W. T. Co.
- LAKE PLEASANT.**—System, Navy, 1000.
- LIEBRE.**—Range, 200; system, I. W. T. Co., 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services 4c per word; station operated and controlled by I. W. T. Co.
- MATSONIA.**—Range, 300.
- MERRIMACK.**—Range, 150.
- MINEOLA.**—Range, 150; w. l., 300, 450, 600.
- MOFFITT.**—Station operated and controlled by R. C. of A.
- MUSCATINE.**—Station operated and controlled by I. W. T. Co.
- OTSEGO.**—Station operated and controlled by S. O. R. S.
- POCAHONTAS.**—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600.
- PLEIADES.**—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600.
- PRINCESS MATOIKA.**—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.
- PRINCETON.**—Range, 300.
- RADIANT.**—Range, 150.
- RAMA.**—Range, 200.
- REPUBLIC.**—Station operated and controlled by Cutting & Washington Radio Corp.
- ROBERT P. CLARK.**—Range, 200; system, I. W. T. Co.; rates, transoceanic service 4c per word.
- SANTA ISABEL.**—Range, 150; system, Marconi, 1000; w. l. 300, 450, 600.
- SANTA LEONORA.**—Station operated and controlled by R. C. of A.
- SEA MONARCH.**—Range, 150; system, Marconi, 1000.
- SEMINOLE.**—W. l., strike out 450.
- SENATOR BAILEY.**—Rates, transoceanic, service 4c per word.
- SHENANGO.**—Range, 200; system, I. W. T. Co., 1000.
- S. O. Co. No. 93.**—Range, 150.
- SOCONY 85.**—Range, 150; system, composite, 1000.
- SOCONY 88.**—Range, 150.
- SOPHIE FRANKEL.**—Name changed to Wisconsin Bridge.
- STAR OF HOLLAND.**—Range, 150; system, Marconi, 1000; station operated and controlled by owner of vessel.
- SUCROSA.**—W. l., 300, 450, 600.
- SWIFTSURE.**—Range, 300; system, Marconi 1000; w. l., 300, 450, 600.
- TIVIES.**—Range, 300.
- TRINIDADIAN.**—System, I. W. T. Co., 1000; rates, North and South American and transoceanic services 4c per word; station operated and controlled by I. W. T. Co.
- TUXPANOIL.**—Station operated and controlled by S. O. R. S.
- WABASH.**—French-American Line owner of vessel.
- WACHUSETT.**—Strike out I. W. T. Co.
- WESTERN QUEEN.**—Station operated and controlled by R. C. of A.
- WEST ISLP.**—Station operated and controlled by I. W. T. Co.

WEST WIND.—Station operated and controlled by S. O. R. S.
WILD DUCK.—Station operated and controlled by I. W. T. Co.
WINIFRED.—System, I. W. T. Co., 1000; rates, transoceanic 4c per word.
 Strike out all particulars of the following ship stations:

Agwistone (KDQP).	Edna.	Kamchatka.	Octorara.
Arlington.	Evangeline.	Kanabec.	Oregon (WOC).
Artec.	Franklin (KDQK).	Lackawanna.	Rebecca Palmer.
Basaan.	Governor Brooks.	Mariana.	Roy Hooper.
Brandon.	H. C. Cadmus.	Matos.	Santurce.
Brookside.	Hewitt.	Moldegaard.	Wahkiakum.
Cape Cod.	Isabela.	Montoso.	Wyoming.
Corozal.	James Timpson.	Oakley C. Curtis.	Yosemite.
Dorothy Palmer.	Jane Palmer.		

The rate for the following-named vessels which are operated and controlled by the Radio Corporation of America will be 8 cents per word for both the North and South American and the transoceanic service, effective May 1, this year:

A. C. Bedford.	Charles M. Everest.	Ernest H. Meyer.	I. D. Fletcher.
Admiral Evans.	Charles Pratt.	Estada Palma. ¹	Intrepid.
Admiral Goodrich.	Charlie Watson.	Eugene V. R. Thayer.	Iris.
Admiral Mayo.	Charlton Hall.	Eurana.	
Admiral Nicholson.	Chester Sun.	Everett (KZT).	J. A. Bostwick.
Admiral Rodman.	Chickasaw City.		James McGee.
Admiral Schley.	China.	Fairmont.	J. A. Moffett.
Admiral Sebree.	China Arrow.	F. D. Asche.	Japan Arrow. ¹
Admiral Watson.	Chinampa.	Feltore.	J. C. Donnell.
Algonquin (KDKH).	Chincha.	Firmore.	J. E. O'Neill.
Amelia.	Christabel.	Florida (KUS).	J. Fletcher Farrell.
America.	Circinus.	Fordonan.	J. M. Danziger.
American Star.	City of Atlanta.	F. Q. Barstow.	John D. Rockefeller.
Ampetco.	City of Augusta.	Franklin (WFF).	John R. Gibbons.
Amphion.	City of Bangor.	Franklin K. Lane. ¹	John Worthington.
Annetta.	City of Columbus.	Frederic Ewing.	Jonancy.
Antigone.	City of Everett.	Frederick R. Kellogg.	Joseph M. Cudahy. ¹
Ardmore.	City of Montgomery.	Fred W. Weller.	Joseph R. Parrott.
Argon.	City of Rockland.	Freedom.	Joseph Seep.
Argonne.	City of Rome.	Freeman.	Josiah Macy.
Ario.	City of Savannah.	Freeport Sulphur No. 1.	J. W. VanDyke.
Astral.	City of Seattle.	Freeport Sulphur No. 2.	
Astrea.	City of St. Louis.	Freeport Sulphur No. 5.	Kamchatka.
Asuncion.	Clarksburg.	Freeport Sulphur No. 6.	Katherine.
Atlantic Sun.	Clausens.	Fueloil.	Koresan.
Atlas.	Clement Smith.	Garfield. ¹	Korosaipa.
Avalon (WFF).	Chincho.	Gargoyles. ¹	Kermanshah.
	Coastwise.	Gdansk.	Kermit.
Bantu.	Col. E. L. Drake.	Gene Crawley.	Kormoor.
Baton Rouge.	Colusa.	George B. MacKenzie.	Koscausko.
Baytown.	Comet.	George G. Henry.	
Bayway.	Communipaw.	George H. Jones.	Lancaster.
Belfast.	Cora F. Cressy.	George Washington. ¹	Liberty Land.
Benjamin Brewster.	Corvus.	George W. Barnes.	Livingstone Roe. ¹
Bessemer City.	Cotopaxi.	Glandola.	L. J. Drake.
Birmingham City.	Crampton Anderson.	Glenpool.	Lurline.
Bradford.	Crafter Hall.	Glen White.	Lydia.
Brammel Point.	Crofton Hall.	Glyndon.	
Bremerton.	Crudoll.	Gold Shell.	Maine.
Brilliant.	Cuboro.	Governor.	Malden.
Brindilla.	Curacao.	Governor Brooks.	Mangora.
Bristol.		Governor Cobb.	Manoa (WMQ).
Broad Arrow.	Dawnlite.	Governor Dingley.	Maracaibo.
Brynildia.	Daylite.	Gratia.	Marina.
Buccaneer.	Dayton.	Gulfpot.	Mariner.
Bylayl.	Deepwater.	Hampden.	Mariners Harbor.
	Democracy.	Harold Walker.	Mary Luckenbach.
Cabrillo.	De Soto.	Harry Farnum.	Mascotte.
C. A. Canfield.	Dewey.	H. C. Folger.	Matinicoek.
Cacique.	D. G. Schofield.	Henry M. Flagler.	Matsonia.
Caddo.	Dochra.	Hera.	Maul.
Caldas.	Dulcino.	Herbert G. Wylie.	Maunakea.
Caloria.	Durbam.	Herbert L. Pratt.	Maratlan.
Calvin Austin.		Herman Winter.	Melroso.
Camden (KRC).	Eagle (KIR).	Hermosa.	Mexicano.
Canibas.	Edward J. Lawrence.	H. F. Dimock.	Mexoll.
Capt. A. F. Lucas.	Edward L. Doheny.	H. H. Rogers.	M. F. Elliott. ¹
Caracas.	Edward L. Doheny, jr.	H. M. Flagler.	Miami.
Carolinian.	E. L. Doheny, Third.	H. M. Whitney.	Middlesex.
Casana.	El Capitan (WNB).	Howick Hall.	Mineola.
Cello.	El Dorado.	Humboldt.	Mobile City.
Centaurus.	Elisha Walker.	Iyader.	Montgomery City.
Coro-Azul. ¹	El Segundo.		Monticello.
Charles Braley.	Ensley City.	Ice King.	Montpelier.
Charles F. Harwood.	Enterprise.	I. C. White.	Montrolite.
Charles H. Cramp.			Moonlite.

¹ Not reported before as being operated and controlled by Radio Corporation of America.

Mount Baker.	Poznan.	S. O. Co. No. 91.	Thomas H. Wheeler.
Mount Rainier.	President.	S. O. Co. No. 93.	Tidewater.
Mount Sidney.	Princess Matoika. ¹	S. O. Co. No. 95.	Tiger.
Mount Sterling.	Princeton.	Socony.	Tormentor.
Mount Summit.	Prulski.	Socony No. 82.	Transportation.
Multnomah.	Queen.	Socony No. 83.	Trinidadian.
Munaires.	Radiant.	Socony No. 84.	Trontolite.
Munabro.	Rajah.	Socony No. 85.	Tunica.
Munamar.	Ransom B. Fuller.	Socony No. 88.	Tuscaloosa City.
Mundale.	Rayo.	Socony No. 89.	Vacuum.
Mundelta.	Redondo (WBM).	Socony No. 90.	Vesta.
Munindies.	Restorer.	Socony No. 92.	Volant.
Munisla.	Richmond (WTR).	Socony No. 94.	Wabash.
Munplace.	Rochester.	Somerset.	Wahkeena.
Munrio.	Rose City.	Sophie Frankel.	Wahkeena.
Munsomo.	Royal Arrow.	Spokane.	Walter D. Munson.
Munwood.	Ruth E. Merrill.	Standard (KIC).	Walter Hardcastle.
Muskogee.	Sabine Sun.	Standard (KXOI).	Walter Jennings. ¹
Nacoochee.	Sagamahoc.	Standard II.	Wapama.
Nanking.	Samuel L. Fuller. ¹	Standard Arrow.	Warsawa.
Nelson.	San Francisco.	Standtow No. 1.	W. B. Keene.
New Britain.	Santa Alicia.	Standtow No. 2.	W. C. Teagle.
Newton.	Santa Ana (WBX).	St. Charles.	Wellington.
Niobe. ¹	Santa Barbara.	Steel Age.	West Cavanal.
Nora.	Santa Cecilia.	Steel Engineer.	West Cawthon.
Norfolk.	Santa Clara.	Steel Exporter.	West Irm.
Norlina.	Santa Cruz.	Steel Inventor.	West Islay.
Norman Bridge.	Santa Elisa.	Steel Maker.	Westoil.
Northern Star.	Santa Eulalia.	Steel Mariner.	Westwego.
Northland (KJD).	Santa Flavia.	Steel Ranger.	W. H. Libby. ¹
Oregon (WGD).	Santa Inez.	Steel Trader.	W. H. Tifford.
Oregon (WOC).	Santa Isabel.	Steel Worker.	Wico.
Orient.	Santa Luisa.	Subatco.	Wilhelmina.
Orinoco.	Santa Malta.	Sucrosa.	Willamette.
Orleans.	Santa Olivia.	Sudbury.	Willfar.
Oscar D. Bennett.	Santa Paula.	Suedco.	William Green.
Oswego.	Santa Rita (WBR).	Suelco.	William H. Doheny.
O. T. Waring.	Santa Rita (WTG).	Suffolk.	William Isom.
Owego.	Santa Rosa.	Sun.	William N. Page.
Pan American.	Santa Rosalia.	Sunbeam.	Willpolo.
Panoll.	Santa Tecla.	Sunlite.	Windber.
Panuco (KMM).	Santa Teresa.	Sunoll.	Winding Gulf.
Paraguay.	Santa Veronica.	Sunshine.	Wisla.
Paul H. Harwood.	Santore.	Suportco.	W. J. Hanna. ¹
Paulsboro.	Satsuma.	Suruga.	W. L. Steed.
Pawnee (WLU).	Saxon.	Susana.	W. M. Burton.
Pearl Shell.	S. B. Hunt.	Susquehanna (KOLN).	Wm. G. Warden.
Pennant.	S. C. T. Dodd.	Susquehanna (WEM).	W. M. Irish.
Perfection.	Security.	Sutransco.	Woonsocket.
Philadelphia (KDA).	Senator.	S. V. Harkness.	W. S. Miller.
Philip Publicker. ¹	Sewalls Point.	Swift Arrow. ¹	Yukon.
Pioneer (KIG).	Sherman.	Swift Star. ¹	Zulia.
Plymouth (KND).	Shooters Island.	Swift Sure.	
Pocahontas.	Silver Shell.	Sylvan Arrow.	
Polarine.	S. M. Spalding.	Tamesl.	
		Tancerville.	

¹ Not reported before as being operated and controlled by Radio Corporation of America.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDPO, *read* Agwistone; KIBM, *read* Wisconsin Bridge; KUDL, *read* Willsolo; WJC, *read* Mount Seward. Strike out all particulars following the call signals KDQK, KDQP, KEMV, KEZS, KGW, KII, KIL, KIPT, KMJ, KNIA, KNR, KOP, KPY, KPW, KPZ, KQIA, KQL, KQT, KQW, KRIO, KUJG, KVT, KWT, KZC, KZY, KZZ, WCQ, WKY, WMII, WNY (New York), WOC, WQEI, WQY, WRAA, WTA, and WWZ.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920.]

CAPE HENRY, VA.—*Read* Virginia Beach, Va.
 DAMISCOVE ISLAND, ME.—Strike out all particulars.
 GRAND HAVEN, MICH.—Strike out all particulars.
 MOOREHEAD CITY, N. C.—*Read* Morehead City, N. C.
 NEW LONDON, CONN.—Strike out all particulars.
 PUGET SOUND, WASH.—*Read* Puget Sound, Wash. (Bremerton), NPZ.
 ROCKAWAY BEACH, N. Y.—Call signal changed to NBT.
 SMITH ISLAND, VA.—Strike out all particulars.
 WATCH HILL, R. I.—Strike out all particulars.
 WILMINGTON, N. C.—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NAH, read NBT; NAN, read Morehead City, N. C.; NCZ, read Virginia Beach, Va.; NPC, read NPZ, Puget Sound, Wash. (Bremerton). Strike out all particulars following the call signals, NAF (Watch Hill, R. I.); NCZ (Smith Island, Va.); NFO, NRZ, NSY, and NWN.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

SAN FRANCISCO, CALIF. (6XO).—Strike out all particulars.

VALLEY CITY, N. DAK. (9ZX).—Strike out all particulars.

MISCELLANEOUS.

OPERATOR'S LICENSE SUSPENDED.

First-grade license No. 20084, issued at Baltimore, Md., October 17, 1919, has been suspended for a period of three months on account of the holder of the license violating article 6 of the International Convention service regulations, in that he caused superfluous signals to be transmitted.

ALASKAN STATIONS NOT OPERATING.

This Bureau has been informed that the radio stations at Cape Edwards, Alaska (KEY), and Port Althorp, Alaska (KIW), will not open this season.

AMENDMENTS.

The Radio Laws and Regulations of the United States, edition August 15, 1919, are hereby amended as follows:

Paragraph 153, page 67, amended April 9, 1921, is modified by the addition of the following proviso: "provided that such renewal of licenses may also be issued in the discretion of the radio inspector where the service record on the back of the license shows 12 months satisfactory service during the two-year period of the license."

GENERAL INFORMATION FROM THE BERNE INTERNATIONAL BUREAU.

Cyrenacia, Erythrea, Italian Somaliland, and Tripolitana.—Since February 1, last, the coast charge for radiotelegraph stations situated in these colonies has been 0 fr. 60 per word.

Ecuador, Czechoslovakia, Venezuela, and China.—These countries adhered to the International Convention on the following dates: Ecuador, April 17, 1920; Czechoslovakia, April 23, 1920; Venezuela, August 13, 1920, and China, September 1, 1920.

Hungary.—The radiotelegraph station of Csepel will transmit, each day, at 11.30 a. m. (Central European time) the bulletin of the Meteorological Institute and the earth's magnetism to Budapest.

Dutch East Indies.—Working hours for the coast station Sitoebondo are as follows: Week days and holidays, 7-8 a. m., 11-12 a. m., 1.30-7 p. m., 10-11 p. m.; Sunday, 1.30-7 p. m.

Turkey.—Normal time has been reestablished in this country.

French East Africa.—The Minister of French Colonies advises that the following class of radiotelegrams are not admitted: Radiotelegrams with paid reply, mandatory radiotelegrams, radiotelegrams with collections, radiotelegrams asking receipted acknowledgement, radiotelegrams with charges to follow, radiotelegrams with service taxes, and urgent radiotelegrams.

France, Algeria, and Portugal.—The legal time in these countries has been advanced one hour.

WATCH HOURS ON FRENCH VESSELS.

Under date of March 1, last, the Berne International Bureau transmitted the table herewith reproduced, indicating the watch hours which have been in effect since January 1, last, on French vessels of the second and third class and operated by the "Radio-Electric Exploitation Co."

Position of zones.	Zone limits.		Hours of watch, mean time, Greenwich.	
	West.	East.	1 operator.	2 operators.
A { East Atlantic; Mediterranean; North Sea; Baltic; West Arctic Ocean.	Meridian 30 W. East coast of Greenland to the E. of 30 W.	Meridian 30 E. to the south African coast; coast of Africa to the west of 30 E. Limits east of the Mediterranean, Black, and Baltic Seas. Meridian 30 E. of N. Norway.	8-10 12-14 16-18 20-22	0-6 8-14 16-18 20-22
B { Indian Ocean; East Arctic Ocean.	Limit east of zone A.....	Meridian 90 E.....	0-2 12-14 16-18 20-22	0-2 4-10 12-14 16-18 20-24
C { China Sea; West Pacific Ocean.	Limit east of zone B.....	Meridian 160 E.....	0-2 4-6 12-14 20-22	0-6 8-10 12-14 16-22
D { Central Pacific Ocean...	Limit east of zone C.....	Meridian 140 W.....	0-2 4-6 8-10 20-22	0-2 4-6 8-10 12-18 20-24
E { East Pacific Ocean.....	Limit east of zone D.....	Meridian 70 W. to the south coast of Argentina; west coasts of the two Americas.	0-2 4-6 16-18 20-22	0-2 4-6 8-14 16-22
F { West Atlantic Ocean; Gulf of Mexico.	Meridian 70 W. South of the coast of Argentina; east coasts of the two Americas.	Meridian 30 W. up as far as the coast of Greenland to the west of meridian 30 W.	0-2 12-14 16-18 20-22	0-2 4-10 12-18 20-22

¹ In the Red Sea the watch period 12-14 will be reported as 6-8 in the morning.

WEATHER CODE FOR VESSEL WEATHER OBSERVERS.

The U. S. Weather Bureau will issue a new edition of its "Radiographic Weather Code for Vessel Weather Observers," which will become effective June 1, 1921, and supersede all previous editions.

The new code book will be ready for distribution about May 1, 1921, and it is expected that the edition will be sufficient for the requirements of all vessel weather observers as well as all Government-controlled vessels having need for it. Application should be made in person or by letter to the Weather Bureau offices in Washington, D. C., New York, New Orleans, Seattle, San Francisco, or Honolulu. If practicable, the old code book should be returned with the application for the new code.

The principal changes in the code are as follows: Time of observation changed from 6 a. m. and 6 p. m. to 7 a. m. and 7 p. m., seventy-fifth meridian time. Position of ships to be reported to nearest six minutes of latitude and longitude instead of to nearest even minute.

No change has been made in the code words except those pertaining to ship's position. The tables containing these words have been simplified and the number of words materially reduced. In all other respects radiograms prepared from the new code can be decoded by use of previous code books.

Masters of ships are requested to secure a copy of the new code book as soon as possible; but to provide for unavoidable delays the new code words for ship's position will be published in early issues of the Hydrographic Office Pilot Chart.

Observers are urged to read the few pages of text carefully and as soon after receipt of the book as is possible, as minor changes have been made which affect some of the details of the observation work.—From *Hydrographic Bulletin*, April 20, 1921.

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APR 23 1926

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, June 1, 1921—No. 50

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name = Name of station.
- G. loc. = Geographical location: O=west longitude, N=north latitude, S=south latitude.
- Call = Call letters assigned.
- System = Radio system used and sparks per second.
- Range = Normal range in nautical miles.
- W. L. = Wave lengths assigned: Normal wave lengths in italics.
- Service = Nature of service maintained:
PG=General public.
PR=Limited public.
P =Private.
O =Government business exclusively.
- Hours =Hours of operation:
N =Continuous service.
X =No regular hours.
m =a. m. (12 m=midday).
s =p. m. (12s=midnight).
- Rates =Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
- I. W. T. Co. =Independent Wireless Telegraph Co.
- R. C. of A. =Radio Corporation of America.
- S. O. R. S. =Ship Owners' Radio Service.
- Co. =Company.
- Corp. =Corporation.
- & =And.
- Do. =Ditto.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Fall River Mills, Calif.	WDJ	200, 250, 275, 300, 600.	PR	X	George H. Taylor.
Newark, N. J. ¹	WJZ	300, 600.	PR	X	Westinghouse Electric & Mfg. Co.
San Francisco, Calif. ²	KFS	300, 600, 1,800.	PG	N	Federal Telegraph Co.
Susanville, Calif.	WDK	200, 250, 275, 300, 600.	PR	X	R. D. Mayes.

¹ Loc. (approximately) 0.74° 10' 00", N. 40° 44' 00"; range, 300; system, composite; rates, none.

² Loc. 0.122° 30' 06", N. 37° 49' 36"; range, 150-2400; system, Navy spark, 1000 and Federal arc; rates, ship service 6 c per word.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
Anniston City	KDSG	Cents.	Cents.	PG	X	U. S. Steel Products Co.	
Astra	KDSE					J. Bullock	
E. T. Bedford	KDSB			PG	N	Standard Oil Co.	
Gloria West	KDSK					H. T. West	
Hambro	KDSH	4	4	PG	X	U. S. Shipping Board	
Keystone State	KDSL	4	4	PG	N	do.	
Manukai	KDSF			PG	X	Matson Navigation Co.	
Marne	KEDJ	4	4	PG	X	U. S. Shipping Board	
Nashaba	KDSM	4	4	PG	X	do.	
Swiftlight	KDSA	4	4	PG	X	do.	
Swift Wind	KDSI	4	4	PG	X	do.	
Tulsagas	KDRZ	4	4	PG	X	do.	
Thomas Crowley	KDSD			PG	X	Andrew F. Crowley	
Undaunted	KDSJ			PG	X	W. Z. Haskins	
West Newark	KDSN	4	4	PG	X	U. S. Shipping Board	
Vicksburg	KDSC					Charles Ward Engineering Works	
Yale	WRY	8		PG	N	Harvard-Yale Syndicate.	Federal Telegraph Co.

¹ Range, 300; system, Navy-Liberty, 1000; w. l., 300, 450, 600.

² Range, 300; system, Navy, 1000; w. l., 300, 600.

Commercial land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDRZ	Tulsagas.....b	KDSK	Gloria West.....b
KDSA	Swiftlight.....b	KDSL	Keystone State.....b
KDSB	E. T. Bedford.....b	KDSM	Nashaba.....b
KDSC	Vicksburg.....b	KEDJ	Marne.....b
KDSD	Thomas Crowley.....b	KFS	San Francisco, Calif.....c
KDSE	Astra.....b	WDJ	Fall River Mills, Calif.....c
KDSF	Manukai.....b	WDK	Susanville, Calif.....c
KDSG	Anniston City.....b	WJZ	Newark, N. J.....c
KDSH	Hambro.....b	WRY	Yale.....b
KDSI	Swift Wind.....b	KDSN	West Newark.....b
KDSJ	Undaunted.....b		

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, only.]

Station.	Call signal.	Station controlled by—
Asheville, N. C.....	4ZD	Piedmont Electric Co.
Bedford, Iowa.....	9XAJ	Bedford Light, Heat & Power Co.
Buena Vista, Ga.....	4XE	William B. Short.
Camden, N. J.....	3YQ	Federal Institute of Radio Telegraphy.
Charlotte, N. C.....	4XD	F. M. Laxton.
Chicago, Ill.....	9XG	Austin A. Howard.
Evansville, Ind.....	9XAH	Ideal Apparatus Co.
Golden, Colo.....	9XAI	Colorado School of Mines.
Forest Hills, Pa.....	8XZ	Harry M. Ryder.
Gunnison, Colo.....	9YAH	Colorado State Normal School.
Lexington, Ky.....	9YAI	Transylvania University.
Lihue, Hawaii.....	6ZAC	Clifford J. Dow.
Los Angeles, Calif.....	6YA	Young Men's Christian Association.
Marion, Mass.....	1ZE	Irving Vermilya.
Memphis, Tenn.....	5XL	William B. Stieg.
New York N. Y.....	2XNA	City College Radio Club.
Do.....	2XNB	Townsend Harris Hall Radio Club.
Noroton Heights, Conn.....	1XAA	Percival E. Fansler.
Northfield, Minn.....	9YAJ	St. Olaf College.
Philadelphia, Pa.....	3XS	George W. Carns.
Portland, Ore.....	7XF	Northwestern Radio Manufacturing Co.
Do.....	7YK	Benson Polytechnic School.
Do.....	7ZB	William A. Leidigh, jr.
Princeton, N. J.....	3XU	Walter V. Roberts.
Richmond, Ind.....	9ZAE	Palladium Printing Co.
San Francisco, Calif.....	6XG	Leo J. Meyberg Co.
Do.....	6ZAB	S. Peterson and Hal Shaw.

Special land stations grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
1XAA	First district:	6ZAB	Sixth district—Continued.
1ZE	Noroton Heights, Conn.	6ZAC	San Francisco, Calif.
	Marion, Mass.		Lihue, Hawaii.
2XNA	Second district:	7XF	Seventh district:
2XNB	New York, N. Y.	7YK	Portland, Ore.
	New York, N. Y.	7ZB	Portland, Ore.
3XS	Third district:	8XZ	Portland, Ore.
3XU	Philadelphia, Pa.		Eighth district: Forest Hills, Pa.
3YQ	Princeton, N. J.	9XG	Ninth district:
	Camden, N. J.	9XAH	Chicago, Ill.
4XD	Fourth district:	9XAI	Evansville, Ind.
4XE	Charlotte, N. C.	9XAJ	Golden, Colo.
4ZD	Buena Vista, Ga.	9YAH	Bedford, Iowa.
5XL	Asheville, N. C.	9YAI	Gunnison, Colo.
	Fifth district, Memphis, Tenn.	9YAJ	Lexington, Ky.
6XG	Sixth district:	9ZAE	Northfield, Minn.
6YA	San Francisco, Calif.		Richmond, Ind.
	Los Angeles, Calif.		

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

BOSTON, MASS.—Range, 500; w. l., 300, 450, 600, 1800.

BROOKLYN, N. Y.—Loc. 0. 74° 00' 15", N. 40° 39' 23".

CAPE MAY, N. J.—Loc. 0. 74° 55' 50", N. 38° 55' 50".

CHATHAM, MASS.—Loc. 70° 46' 30", N. 41° 42' 45"; w. l., 300, 450, 600, 1800.

DALLAS, TEX.—W. l., 300, 500, 600.

KAUNAKAKAI, HAWAII.—System, composite; w. l., 300, 550, 600.

KAWAIHAE, HAWAII.—Range, 300; w. l., 300, 550, 600.

LAHAINA, HAWAII.—Range, 300; w. l., 300, 550, 600.

LATOCHE, ALASKA.—Range, 200; system, Kilbourne & Clark, 1000.

LIHUE, HAWAII.—Range, 300; w. l., 300, 550, 600.

NEW LONDON, CONN.—Loc. 0. 72° 05' 44'', N. 41° 19' 59''.

NEWPORT, R. I.—0. 71° 18' 55'', N. 41° 29' 10''.

NEW YORK, N. Y. (KDKF).—Hours, N.

PIRATE COVE, ALASKA.—Range, 500; system, Halcun, 720.

ROCKLAND, ME.—W. l., 300, 450, 600, 1800; rates, ship service 10 c per word.

SIASCONSET, MASS.—Loc. 0. 69° 58' 10'', N. 41° 16' 35''.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ABNER COBURN.—Range, 300; w. l., 300, 550, 600.

ACROPOLIS.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; hours, N.; rates, North and South American and transoceanic services 8 c per word; station operated and controlled by R. C. of A.

ADMIRAL EVANS.—System, Marconi, 1000; w. l., 300, 450, 600.

AMERICAN STAR.—System, Navy-Marconi, 1000; w. l., 300, 450, 600; hours, X.

AMOLCO.—W. l., 300, 600; no rates.

ANNETTA.—Range, 150; system, Marconi, 1000; w. l., 300, 450, 600.

ANTIGONE.—Name changed to Potomac; range, 300; system, Telefunken, 1000; w. l., 300, 450, 600.

ARAGON.—Hawk S. S. Line owner of vessel.

BATON ROUGE.—Range, 300.

BAYTOWN.—Range, 300; system, Marconi, 1000; w. l., 300, 600.

BAYWAY.—Range, 300; w. l., 300, 600.

BENJ. F. PACKARD.—Range, 300.

BUCKEYE STATE.—Station operated and controlled by S. O. R. S.

CABRILLO.—System, Marconi, 1000; rates, 1 c per word between East San Pedro and Avalon, Calif.

CALICOROCK.—System, Navy-Marconi, 1000.

CALVIN AUSTIN.—Range, 150; system, Marconi, 1000; w. l., 300, 450, 600.

CAMDEN (KRC).—Hours, N. and X.

CECIL COUNTY.—Range, 300; system, Fessenden, 1000; w. l., 300, 450, 600.

CENTENNIAL STATE.—System, Independent arc; station operated and controlled by I. W. T. Co.

CERALVO.—System, Navy, 1000; w. l., 300, 450, 600.

CHICAGO BRIDGE.—Station operated and controlled by I. W. T. Co.

CIGARETTE.—Range, 150; system, W. S. A. Co., 1000; service, PG; hours, X; rates, North and South American and transoceanic services 4 c per word; Barron G. Collier owner of station; station operated and controlled by S. O. R. S.

CITY OF ELWOOD.—Station operated and controlled by R. C. of A.

CITY OF EVERETT.—Range, 150; system, Marconi, 1000.

CITY OF PARA.—Rates, North and South American service, 8 c per word; transoceanic, no rates.

COALINGA.—Rates, North and South American service, 8 c per word; transoceanic, no rates.

COLOMBIA.—Rates, North and South American service and transoceanic service 8 c per word.

CONNERSVILLE.—System, Navy-Marconi, 1000.

CONSHOCKEN.—Name changed to Willhilo.

COPERAS.—System, Navy-Marconi, 1000.

CORCORAN.—Range, 200; system, Navy-Simon, 1000.

- COTTONWOOD.—System, Navy, 1000.
- COUSHATTA.—System, Navy-Marconi, 1000.
- COWICHE.—System, Navy-Marconi, 1000.
- CUBA (KDRT).—Rates, North and South American and transoceanic services 8 c per word; station operated and controlled by R. C. of A.
- CUBA (WQU).—Rates, North and South American service, 8 c per word; transoceanic, no rates.
- DADE COUNTY.—Station operated and controlled by R. C. of A.
- DELCO.—Station operated and controlled by Moore & McCormack.
- DELISLE.—Range, 300; system, Federal arc; w. l., 300, 450, 600, 1800.
- DE SOTA.—Range, 300.
- ECUADOR.—Rates, North and South American and transoceanic services 8 c per word.
- EDWARD PIERCE.—Range, 200; system, Wireless Specialty Apparatus Co., 1000; station operated and controlled by owner of vessel.
- EL ESTERO.—Range, 150; system, Marconi, 1000.
- EL ISLEO.—Range, 150; system, Marconi, 1000.
- EL LAGO.—Range, 150; system, Marconi, 1000; w. l., 300, 600.
- ENDICOTT.—System, Navy; w. l., 300, 450, 600.
- FAIRFIELD CITY.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; hours, X; rates, North and South American and transoceanic services 8 c per word; station operated and controlled by R. C. of A.
- FELIX TAUSIG.—Range, 200; system, Wireless Specialty Apparatus Co., 1000; station operated and controlled by owner of vessel.
- FOREST KING.—Forest King Co. owner of vessel.
- F. Q. BARSTOW.—Range, 150.
- FRANK H. BUCK.—Rates, North and South American services, 8 c per word; transoceanic, no rates.
- FREDERIC R. KELLOGG.—W. l., 300, 450, 600.
- GEORGE C. GREER.—Range, 150; system, Fessenden, 1000; w. l., 300, 450, 600; Magnolia Petroleum Co. owner of vessel; station operated and controlled by owner of vessel.
- GEORGIA (WFA).—Crosby Transportation Co. owner of vessel.
- GOODSPEED.—System, Navy-Marconi, 1000.
- GOVERNOR DINGLEY.—Range, 150; system, Marconi, 1000; w. l., 300, 450, 600.
- GRECIAN.—Rates, transoceanic services 8 c per word.
- GULF OF MEXICO.—Range, 150.
- HAROLD WALKER.—Range, 300.
- HERBERT G. WYLIE.—Range, 300; hours, X.
- HERMORA.—System, Marconi, 1000; service, PG; rates, 1 c per word between East San Pedro and Avalon, Calif.
- HOG ISLAND.—Range, 300; system, Navy Marconi, 1000; w. l., 300, 450, 600.
- HOLDEN EVANS.—Station operated and controlled by owner of vessel.
- HONOLULU.—Station operated and controlled by Moore & McCormack Co.
- HOWICK HALL.—Range, 150.
- INTREPID.—Range, 150; system, Marconi, 1000; w. l., 300, 600.
- INVINCIBLE.—W. l., 300, 450, 600.
- ISANTI.—System, Navy-Wireless Specialty Apparatus Co., 1000.
- J. A. BOSTWICK.—Range, 300.
- JAPAN ARROW.—Range, 300; system, R. C. of A., 1000; w. l., 300, 600; hours, X.
- JAVA ARROW.—Hours, N.
- JEFF DAVIS.—Station operated and controlled by S. O. R. S.
- JONANCY.—Range, 150; system, Navy, 1000; w. l., 300, 450, 600.
- KANAWHA.—Black Star Line owner of vessel.

- KENNECOTT.**—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, 550, 600; rates, North and South American and transoceanic services, 4 c per word; station operated and controlled by owner of vessel.
- KINGFISHER (KDNJ).**—Range, 200; system, I. W. T. Co., 1000; rates, North and South American and transoceanic services, 4 c per word.
- LA BREA.**—Rates, North and South American service, 8 c per word; transoceanic service, no rates.
- LAKE COPLEY.**—System, Navy-Marconi, 1000.
- LAKE FLAG.**—Range, 200; system, Navy, 1000; w. l., 300, 450, 600.
- LAKE FLUME.**—System, Navy-Marconi, 1000.
- LAKE FONDA.**—System, Navy-International, 1000.
- LAKE GIRARDEAU.**—Range, 200; system, Navy-Marconi, 1000; w. l., 300, 600.
- LAKE JANET.**—System, Navy-Marconi, 1000.
- LAKE LOUISE.**—System, Navy-Marconi, 1000.
- LAKE MIRAFLORES.**—Station operated and controlled by I. W. T. Co.
- LAKE ST. REGIS.**—Range, 200; system, Navy-Marconi, 1000.
- LAKE WASHBURN.**—System, Kilbourne & Clark, 1000.
- LANSING.**—Rates, North and South American service, 8 c per word; transoceanic service, no rates.
- LA PLACENTIA.**—Range, 300; system, R. C. of A., 1000; rates, North and South American and transoceanic services, 8 c per word; station operated and controlled by R. C. of A.
- LITHOPOLIS.**—System, Navy-Marconi, 1000.
- LIVINGSTONE.**—Name changed to Westland.
- L. J. DRAKE.**—W. l. 300, 450, 600; hours, X.
- LOS ANGELES.**—Rates North and South American service, 8 c per word; transoceanic, no rates.
- LYMAN STEWART.**—Rates, North and South American service, 8 c per word; transoceanic, no rates.
- MANATEE.**—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600.
- MANULANI.**—Range, 300; system, R. C. of A., 1000; rates, North and South American and transoceanic services, 8 c per word; station operated and controlled by R. C. of A.
- MARINA.**—Range, 150.
- MARNE (KDLV).**—Station operated and controlled by R. C. of A.
- MAUNA KEA.**—Range, 150; system, Marconi, 1000.
- MEANTICUT.**—Station operated and controlled by S. O. R. S.
- MINNESOTA (WEK).**—Station operated and controlled by S. O. R. S.
- MOUNT CLAY.**—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, 600, 1800; rates, North and South American and transoceanic services, 8 c per word; station operated and controlled by owner of vessel.
- NEW BRITAIN.**—W. l. 300, 450, 600.
- NEWPORT.**—Rates, North and South American service, 8 c per word; transoceanic, no rates.
- NOBLES.**—Station operated and controlled by R. C. of A.
- NORA.**—Range, 300; system, Marconi, 1000.
- NORMAN BRIDGE.**—Range, 300.
- NORTH LAND (KJD).**—Range, 150; system, Marconi, 1000.
- NYANZA.**—Station operated and controlled by Moore & McCormack.
- OLEUM.**—Rates, North and South American service, 8 c per word; transoceanic, no rates.
- ORLEANS.**—System, Navy-Marconi, 1000; hours, X.
- OSAGE.**—Station operated and controlled by Moore & McCormack.
- OZMO.**—Station operated and controlled by owner of vessel.

- PARTHIAN.**—Station operated and controlled by owner of vessel.
- PEQUOT.**—Range, 150; system, Simon, 1000; hours, X.
- PERFECTION.**—Range, 150; w. l., 300, 600.
- POINT ADAMS.**—Rates, North and South American service, 8 c per word; transoceanic no rates.
- POINT BONITA.**—Rates, North and South American service, 8 c per word; transoceanic, no rates.
- POINT JUDITH.**—Rates, North and South American service, 8 c per word; transoceanic, no rates.
- POINT LOBOS.**—Rates, North and South American service, 8 c per word; transoceanic, no rates.
- RAYO.**—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600.
- SAG HARBOR.**—System, Navy-Marconi, 1000.
- SAN JOSE (WWL).**—Rates, North and South American service, 8 c per word; transoceanic, no rates.
- SAN JUAN (KULV).**—Range, 150; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600; hours, X and N; rates, North and South American service, 4 c per word; station operated and controlled by owner of vessel.
- SAN JUAN (WWM).**—Rates, North and South American service, 8 c per word; transoceanic, no rates.
- SANTA CECILIA.**—Range, 300; w. l., 300, 450, 600.
- SANTA LEONORA.**—System, Navy-Marconi, 1000.
- SILVER STATE.**—Range, 150-300; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600, 1800; station operated and controlled by S. O. R. S.
- SIXAOLA.**—Range, 300; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, 600, 1800.
- S. M. SPALDING.**—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600.
- SOCONY.**—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600.
- SOCONY 82.**—Range, 150.
- SOCONY 83.**—Range, 150.
- SOCONY 84.**—W. l., 300, 450, 600; hours, X.
- SOCONY 89.**—Range, 150.
- SOCONY 90.**—Range, 150.
- SOCONY 92.**—Range, 150.
- SOLANA.**—Rates, North and South American service, 8 c per word; transoceanic service, no rates; station operated and controlled by Federal Telegraph Co.
- STANLEY DOLLAR.**—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600; rates, transoceanic, no rates; station operated and controlled by I. W. T. Co.
- STEPHEN R. JONES.**—Range 200; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.
- SUNEWCO.**—Range, 300; system, Navy, 1000; w. l., 300, 450, 600; station operated and controlled by Transmarine Corp.
- SWIFT EAGLE.**—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services, 8c per word; station operated and controlled by R. C. of A.
- SWIFT SCOUT.**—Range, 150; system, Marconi, 1000; w. l., 300, 450, 600; hours, X.
- TANCARVILLE.**—Range, 150; system, Marconi, 1000.
- TENAFLY.**—Station operated and controlled by S. O. R. S.
- TUXPANOIL.**—U. S. Shipping Board owner of vessel.
- VANCOLITE.**—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; hours, X.
- VENEZUELA.**—Rates, North and South American and transoceanic services, 8 c per word.
- VIRGINIA BRIDGE.**—Range, 300; system, Navy, 1000.
- VITTORIO EMMANUELE III.**—System, Navy-Marconi, 1000.

WALTER JENNINGS.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; hours, X.
 WASHTEENAW.—Range, 300; North and South American service, 8 c per word; transoceanic, no rates.

WENATCHEE.—Range, 300-1000; system, Simon-spark, 1000 and Federal arc.; w. l., 300, 450, 600, 1800.

WEST BRIDGE.—System, Navy, 1000.

WEST INDIAN.—Station operated and controlled by I. W. T. Co.

WESTLAKE.—Hours, N.

WESTOIL.—Edward P. Farley Co., owner of vessel.

WEST TOGUS.—Station operated and controlled by S. O. R. S.

WEST ZUCKER.—System, Navy, 1000; hours, X.

W. F. BURROWS.—Range, 200; w. l., 300, 450, 550, 600; rates, transoceanic, no rates.

WHITTIER.—Rates, North and South American service, 8 c per word; transoceanic no rates.

WICHITA.—Station operated and controlled by I. W. T. Co.

WICO.—Range, 300; system, Marconi, 480; w. l., 300, 450, 600.

WILLIAM ISOM.—Range, 300.

WILLPOLO.—Range, 300; system, Navy-Liberty, 1000; w. l., 300, 600.

WM. F. HERRIN.—Rates, North and South American service, 8 c per word; transoceanic, no rates.

W. S. RHEEM.—Name changed to Shreveport.

Strike out all particulars of the following-named stations:

Adway.	Bottineau.	Fort Stevens.	Navahoe.
Afalkey.	Boxbutte.	G. A. Flagg.	Nupolela.
Alanthus.	Boxley.	Gonzaba.	Octorara.
Alector.	Buckhorn.	Kangl.	Oregon (WOU).
Alvada.	Bugaya.	Katonah.	Rama.
Aowa.	Butte.	Kineo.	Seguranca.
Atlantus.	Cawker.	Kokomo.	Sewickley.
Arundel.	Clackamas.	Latoka.	Umatilla.
Balliett.	Clio.	Lewiston.	Wansu.
Bancroft.	Cocoonino.	Mahaska.	Wayucan.
Banicaa.	Colindo.	Manada.	Wilhaha.
Bell Brook.	Cotteral.	Mannahocking.	Yakima.
Berela.	Dardania.	Mazatlan.	Yawah.
Bollston.	Floraba.	Mendora.	Wild Duck.
Bonnafon.	Fort Riley.	Morganza.	
Bonneteere.	Fort Scott.	Munra.	

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDOY, *read* Westland; KOKN, *read* Potomac; KUGV, *read* Willhilo; WGAO, *read* Shreveport. Strike out all particulars following the call signals, KDFL, KDHE, KEBG, KEBJ, KECF, KEDF, KEGB, KEJB, KEKF, KEQF, KEPZ, KERD, KETL, KETQ, KETS, KEZX, KICC, KICD, KIGN, KIKN, KIKZ, KKUA, KNOA, KNOI, KNOU, KNUI, KNUU, KOR, KPEA, KPPI, KPUI, KQEA, KQEI, KRX, KSUI, KSUO, KUBQ, KVIA, KWG, KYG, WBEA, WBEE, WCAE, WCD, WCEA, WDAA, WDAU, WDEA, WFAU, WGEE, WLOE, WLUA, WMIA, WNOE, WOU, WQOU, WRIA, WRUA, WSOU, WVEE, WXIO, WZEI.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

OELWEIN, IOWA (9ZQ).—Strike out all particulars.

PORTLAND, OREG. (7ZB).—Strike out all particulars.

SAN FRANCISCO, CALIF. (6XG).—Strike out all particulars.

MISCELLANEOUS.

NEW RATES FOR STATIONS OF MUTUAL TELEPHONE CO. IN HAWAII.

MAY 28, 1921.

SIR: Complying with your request of the 3d instant, you are hereby authorized, effective from July 1 next, to modify your licenses numbers 67, 76, 80, 82, and 83, so as to show the following rates for traffic handled at the stations herein named:

Interisland messages between the stations at Wahiawa, Lihue, Lahaina, Kaunakakai, and Kawaihae; ordinary messages 15 cents per word; press messages $7\frac{1}{2}$ cents per word; cipher or code messages, origin and destination Hawaiian Islands, 25 cents per word; night letters, first 24 words (minimum charge), \$1, each additional word 4 cents. Night letters may be filed at any time, and will be delivered on the morning following date of filing. Night letters are not accepted for ships at sea. Night letters must be in plain language. Cablegrams or trans-Pacific wireless messages in cipher, code, foreign, or English will be accepted and forwarded at ordinary rates plus the forwarding charges of the cable or wireless company, when such messages are to be delivered to them for forwarding. Double-rush messages, which means all other traffic on the line stopped, except any previously filed double-rush message, and the double-rush message put through immediately, will be charged for at double rate. Messages filed in any language other than English will be charged for at code rate.

Ship messages via Wahiawa, Oahu, long distance station: Messages from ship to shore or shore to ship from or to any point on the islands of Oahu, Hawaii, Maui, Kauai, or Molokai 10 cents per word; press messages 5 cents per word, minimum charge 50 cents.

Respectfully,

C. H. HUSTON,
Assistant Secretary of Commerce.

MUTUAL TELEPHONE CO.,
*Superintendent Wireless Dept.,
Honolulu, Hawaii.*

OPERATORS' LICENSES SUSPENDED.

First-grade license No. 19417, issued at San Francisco, Calif., November 26, 1919, has been suspended for a period of three months on account of violation of article 6 of the International Convention service regulations, in that the holder of the license transmitted superfluous signals.

First-grade license No. 20741, issued at New York, N. Y., April 5, 1920, has been suspended for a period of three months on account of violation of section 7 of the act of August 13, 1912, in that the holder of the license transmitted a false call signal.

First-grade license No. 22302, issued at Baltimore, Md., February 10, 1921, has been suspended for a period of one month on account of violation of article 6 of the International Convention service regulations, in that the holder of the license transmitted superfluous signals.

First-grade license No. 19357, issued at New Orleans, La., January 7, 1920, has been suspended for a period of three months on account of violation of section 7 of the act of August 13, 1912, and article 6 of the International Convention service regulations, in that the holder of the license transmitted a false call signal and superfluous signals.

NOTICE TO MARINERS.

Dominion of Canada, No. 10-1921.

[Atlantic No. 6.]

NEW BRUNSWICK: BAY OF FUNDY—ST. JOHN HARBOR ENTRANCE—RADIO TELEGRAPH DIRECTION FINDING STATION ESTABLISHED.

1. The attention of masters of all vessels fitted with radiotelegraph apparatus is called to the fact that a new radiotelegraph direction finding station has been established named "St. John, N. B., Direction Finding Station."

2. Position: Near Red Head on east side of entrance to harbor and 1.93 miles, $67^{\circ} 25'$ (N. $88^{\circ} 55'$ E. mag.) from Partridge Island lighthouse. Latitude N. $45^{\circ} 15' 4''$, longitude W. $66^{\circ} 00' 47''$.

3. The same procedure is to be followed as described in Notice to Mariners No. 39 (93) of 1920.

4. The call signal of the station is VAR, and the wave length to be used in transmitting and receiving will be 800 meters.

All bearings, unless otherwise noted, are true and are given from seaward in degrees from 0° (north) to 360° , measured clockwise, followed by the magnetic bearing in degrees in brackets, miles are nautical miles, heights are above high water of ordinary spring tides, and all depths are at low water of ordinary spring tides.

CHANGE IN U. S. NAVAL RADIO STATIONS.

Effective, May 20, this year, the working wave of the Darien station, C. Z. (NBA), will be changed to 10,110 meters. The time signals will be sent out at 4.55 a. m. and 12.55 p. m., seventy-fifth meridian time.

Hereafter the station at Marshfield, Oreg. (NPF), will be open between 8. a. m. and 10 p. m. daily.

AMATEUR LICENSES REVOKED.

Several amateur second-grade operators have had their operators' and station licenses revoked for failure to appear for examination for an amateur first-grade license when given opportunity to do so.

ELECTRICALLY ENERGIZED CABLE FOR PILOTING VESSELS.

The following information was received from the American consul general, London, under date of April 25, 1921: "According to an announcement made by the British Admiralty, the leader cable is available for use, without charge, for vessels leaving or making Spithead in thick weather or for purposes of experiment. Application for the use of the cable should be made by the wireless station at Niton, Isle of Wight, call signal GNI, to the captain of the signal school at Portsmouth, or by telegraph on land. The seaward end of the cable is situated about $6\frac{1}{2}$ miles southward from Nab Tower, in latitude $50^{\circ} 33' 38''$ N., longitude $0^{\circ} 56' 43''$ W."

PARAGRAPH 86 OF REGULATIONS REPEALED.

MAY 28, 1921.

To radio inspectors and others concerned:

Paragraph 86 of the Regulations Governing Radio Communication, edition of August 15, 1919, page 58, is hereby repealed to take effect on July 1, 1921, as to stations now operating without license under paragraph 86, and to take effect immediately as to new stations for which applications may be filed under paragraph 86.

For the Secretary:

C. H. HUSTON,
Acting Secretary of Commerce.

CHANGE IN HOURS OF OPERATION FOR STATION OF SEAMEN'S CHURCH INSTITUTE.

The radio station of the Seamen's Church Institute Radio School (KDKF), located at 25 South Street, New York, N. Y., now maintains a continuous watch for the purpose of giving medical advice in cases where persons are injured or sick on vessels at sea.

GENERAL INFORMATION FROM THE BERNE INTERNATIONAL BUREAU.

Faroe Islands.—Beginning May 1, this year, the inland telegraphic charge applicable to radiotelegrams originating in or intended for localities in the Faroe Islands and exchanged directly with the coast stations of the islands is 0 fr. 14 per word for ordinary radiotelegrams, with a minimum of 1 fr. 40, and 0 fr. 42 per word for urgent radiotelegrams with a minimum of 4 fr. 20 per radiogram.

Portugal.—The coast station, Porto, now has permanent service (N).

Erythrea.—The hours of service of the coast stations of Assab radio and Massaua I R G are now as follows:

Assab Radio 1-5 a. m., 8-11 a. m., 4-7 p. m., Greenwich mean time.

Massaua I R G: 12 (noon) to 5 a. m., Greenwich mean time.

Italy.—Beginning May 1, this year, each radiogoniometric bearing worked out by a fixed Italian station, requested by a movable station, shall be subject to the collection of a fixed station tax of 6 francs. The radiotelegrams of this kind will be considered in the settling of accounts under the same conditions as the ordinary radiotelegrams originating on ships and destined for Italy.

Norway.—The coast stations of Flekkeroy and Tjome maintain a permanent service. N will replace N¹ (column 8) in the nomenclature of radiotelegraphic stations.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, July 1, 1921—No. 51

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name	=Name of station.
G. loc.	=Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call	=Call letters assigned.
System	=Radio system used and sparks per second.
Range	=Normal range in nautical miles.
W. L.	=Wave lengths assigned: Normal wave lengths in italics.
Service	=Nature of service maintained:
	PG=General public.
	PR=Limited public.
	P =Private.
	O =Government business exclusively.
Hours	=Hours of operation:
	N =Continuous service.
	X =No regular hours.
	m =a. m. (12m=midday).
	s =p. m. (12s=midnight).
Rates	=Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co.	=Independent Wireless Telegraph Co.
R. C. of A.	=Radio Corporation of America.
S. O. R. S.	=Ships Owners Radio Service.
Co.	=Company.
Corp.	=Corporation.
&	=And.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Hillsboro, Oreg. ¹	KGH	300, 600, 8,300, 9,400, 14,200, 15,300.	PR	X	Federal Telegraph Co.
Palo Alto, Calif. ²	KWT	300, 600, 8,300, 9,400, 14,200, 15,300.	PR	X	Do.
San Francisco, Calif..	KHH	300, 570, 600.....	PR	X	John P. Hickey.

¹ Loc. (approximately) 0.122° 59' 00", N. 45° 31' 00"; rates, from San Francisco to Portland, Oreg., 15 words rush, 60 c.; day letter, 50 words, 90 c.; night letter, 50 words, 80 c.; from San Francisco to Los Angeles and San Diego, 15 words rush, 48 c.; day letter, 50 words, 72 c.; night letter, 50 words, 48 c.; from San Francisco to Seattle and Tacoma, 15 words rush, 72 c.; day letter, 50 words, \$1.08; night letter, 50 words, 72 c.

² Loc. (approximately) 0.122° 07' 30", N. 37° 28' 00"; rates, from San Francisco to Portland, Oreg., 15 words rush, 80 c.; day letter, 50 words, 90 c.; night letter, 50 words, 60 c.; from San Francisco to Los Angeles and San Diego, 15 words rush, 48 c.; day letter, 50 words, 72 c.; night letter, 50 words, 48 c.; from San Francisco to Seattle and Tacoma, 15 words rush, 72 c.; day letter, 50 words, \$1.08; night letter, 50 words, 72 c.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
Agwibay.....	KDSR	Cents.	Cents.	PG	N	Atlantic, Gulf & West Indies S. S. Lines.	R. C. of A.
Atlanta City.....	KDSW			PG	X	U. S. Steel Products Co.	
Betty R.....	KDTF			PR	X	Edward G. Crossett...	
Blue Hen State.....	KDTC	4	4	PG	N	U. S. Shipping Board.	
Bohemian Club.....	KDTB	4	4	PG	X	do.	
David McKelvy.....	KDTD			PG	X	Tidewater Oil Co.	
Dixiano.....	KDSP	4	4	PG	X	American Sugar Transit Corp.	
Empire State.....	KDSV	4	4	PG	N	U. S. Shipping Board.	
Hammac.....	KDTJ						
Huron ¹	WCH			PG	X	Wyandotte Transportation Co.	R. C. of A.
Illinois.....	KDSZ			PG	X	Texas Co.	
Liberator.....	KDTA					Lybeck Ocean Harvester Co.	
Lio.....	KDSO	4	4	PG	X	U. S. Shipping Board.	
Nourmahal.....	KDTI					Vincent Astor.....	
Playa.....	KDTE						
Puente.....	KDSS			PG	X	Union Oil Co.	Owner of vessel. Do.
Sea Ranger.....	KDSQ			PG	X	Ship Owners & Merchants Tugboat Co.	
Sea Scout.....	KDSY			PG	X	do.	
Tecomate.....	KDST			PG	X	Kyle & Purdy.....	
"323".....	KDTH					John B. Paine.....	
Toteco.....	KDSU			PG	X	Kyle & Purdy.....	
West Faralon.....	KDSX	4	4	PG	X	U. S. Shipping Board.	
Yankee Arrow.....	KDTG			PG	X	Standard Transportation Co.	

¹ Range, 150; system, R. C. of A., 1,000; w. l., 300, 600; rates, Great Lakes service, 2 c. per word.

Commercial land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDSO	Lio.....b	KDTC	Blue Hen State.....b
KDSP	Dixiano.....b	KDTD	David McKelvy.....b
KDSQ	Sea Ranger.....b	KDTE	Playa.....b
KDSR	Agwibay.....b	KDTF	Betty R.....b
KDSS	Puente.....b	KDTG	Yankee Arrow.....b
KDST	Tecomate.....b	KDTH	"323".....b
KDSU	Toteco.....b	KDTI	Nourmahal.....b
KDSV	Empire State.....b	KDTJ	Hammac.....b
KDSW	Atlanta City.....b	KGH	Hillsboro, Oreg.....c
KDSX	West Faralon.....b	KHH	San Francisco, Calif.....c
KDSY	Sea Scout.....b	KWT	Palo Alto, Calif.....c
KDSZ	Illinois.....b	WCH	Huron.....b
KDTA	Liberator.....b	WRH	Harvard.....b
KDTB	Bohemian Club.....b		

Government land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Manati, Cuba.....	NMB	U. S. Navy.
Quantico, Va.....	NFV	Do.

Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Corry.....	NUQZ	Mahanna.....	NURB
Eagle 24.....	NEKJ		

Government land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NEKJ	Eagle 24.....b	NUQZ	Corry.....b
NFV	Quantico, Va.....c	NURB	Mahanna.....b
NMB	Manati, Cuba.....c		

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, only.]

Station.	Call signal.	Station controlled by—
Cambridge, Mass.....	1XAB	Clapp-Eastham Co.
Lexington, Va.....	3ZX	Harry M. Quisenberry.
Napa, Calif.....	6ZAD	J. J. Mahler, jr.
Oakland, Calif.....	6ZAE	Chris F. Eiferle.
Olympia, Wash.....	7ZP	Edwin W. Wilson.
Philadelphia, Pa.....	3XV	Thomas Appleby.
Pittsburgh, Pa.....	8XM	Phillips Thomas.
San Antonio, Tex.....	5XP	E. M. Baker.
Do.....	5ZAI	R. C. Walker.
Do.....	5ZR	John C. Rodriguez.
Spokane, Wash.....	7YL	North Central High School.
Sunnyvale, Calif.....	6XAG	The Radio Shop.
Worcester, Mass.....	1YK	Worcester Polytechnic Institute.

Special land stations grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
1XAB	First district:	6XAG	Sixth district:
1YK	Cambridge, Mass.	6ZAD	Sunnyvale, Calif.
	Worcester, Mass.	6ZAE	Napa, Calif.
3XV	Third district:		Oakland, Calif.
3ZX	Philadelphia, Pa.	7YL	Seventh district:
	Lexington, Va.	7ZP	Spokane, Wash.
5XP	Fifth district:	8XM	Olympia, Wash.
5ZAI	San Antonio, Tex.		Pittsburgh, Pa.
5ZR	Do.		
	Do.		

ALTERATIONS AND CORRECTIONS.**COMMERCIAL LAND STATIONS.**

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

EAST HAMPTON, N. Y.—Range, 500; system, Cutting & Washington, 1000; w. l., 300 600, 1800.**FALL RIVER MILLS, CALIF.**—Range, 100; system, composite; rates, none.**LOST HARBOR, ALASKA.**—Range, 200**NEWARK, N. J.**—W. l., 300, 600, 3100.**NEWPORT, R. I.**—Range, 300; system, Marconi, 1,000; w l., 300, 450, 600; hours, 8 p. m.—5 a. m.**SUSANVILLE, CALIF.**—Range, 100; system, composite, 240; rates, none.**COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.**

Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ADMIRAL SEBREE.—Range, 150; hours, X**AJAX**—South Pacific Seas Co. owner of vessel.**ARDEN**—Station operated and controlled by S. O. R. S.**AUDITOR**—Range, 300; system, Navy-Marconi, 1,900.**BAYOU CHICO.**—Station operated and controlled by I. W. T. Co.**BRISTOL.**—Range, 300; system, Navy-R. C. of A., 1,900; w. l., 300, 450, 600.**BYLAYL.**—W. l., 300, 450, 600.**CALLABASAS.**—System, Navy, 1,900; w l., 300, 450, 600.

- CAMDEN (KDKL).—Range, 300; system, Wireless Specialty Apparatus Co., 1,000; w. l., 300, 600; hours, X.
- CHICAGO.—Range, 200.
- CITY OF SEATTLE.—Range, 150; system, Marconi, 1000.
- CITY OF SHERMAN.—U. S. S. B. owner of vessel.
- COMUS.—Range, 300; w. l., 300, 600.
- COOT.—Station operated and controlled by owner of vessel.
- CORONADO.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
- CUBORE.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600.
- DARTFORD.—Station operated and controlled by S. O. R. S.
- DELPHINE.—Service, PG; hours, X.
- DIRECTOR.—Northern Transportation Co. owner of vessel; station operated and controlled by owner of vessel.
- ELDORADO.—Range, 300; system, Marconi, 480; w. l., 300, 450, 600.
- ESSEX.—Range, 150.
- E. T. BEDFORD.—Station operated and controlled by R. C. of A.
- FLORENCE OLSON.—Station operated and controlled by owner of vessel.
- FRANKLIN COUNTY.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 600.
- GEO. H. JONES.—System, R. C. of A., 1000.
- GLENDDOLA.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
- GLORIA WEST.—Range, 150; system, Navy-Simon, 1000; w. l., 300, 450, 600; service, PG; hours, X; station operated and controlled by owner of vessel.
- GLYNDON.—W. l., 300, 450, 600.
- HASTINGS.—Station operated and controlled by I. W. T. Co.
- HENRY COUNTY.—System, Navy-Wireless Improvement Co., 1000; w. l., 300, 600.
- I. J. MERRITT.—Range, 200; system, Navy-Marconi, 1,000; rates, North and South American service 4 c. per word; station operated and controlled by owner of vessel.
- INDIA ARROW.—Range, 300; system, Marconi, 1000; hours, X; rates, North and South American and transoceanic services 8 c. per word; station operated and controlled by R. C. of A.
- JAVA ARROW.—Range, 300; system, R. C. of A., 1000; hours, X; station operated and controlled by R. C. of A.
- J. FLETCHER FARRELL.—Sinclair Navigation Co. owner of vessel.
- J. M. DANZIGER.—Range, 300.
- KETCHIKAN.—Rates, transoceanic service 8 c. per word.
- KEYSTONE STATE.—Station operated and controlled by S. O. R. S.
- KVICHAK.—System, Marconi, 1 000; service, PR and PG; hours, N and X; rates, North and South American service 8 c. per word.
- LABORER.—Northern Transportation Co. owner of vessel.
- LAKE DUNMORE.—Station operated and controlled by R. C. of A.
- LAKE FANDANGO.—Range, 200; system, Navy-Marconi, 1,000.
- LAKE FITCH.—System, Navy-Marconi, 1000; w. l., 300, 600.
- LAKE FURNAS.—Range, 200; system, Navy-Marconi, 1,000.
- LAKE GEDNEY.—System, Navy-Marconi, 1,000.
- LEVISA.—Range, 200.
- MANUKAI.—Range, 150; system, R. C. of A., 1,000; rates, North and South American and transoceanic services 8 c. per word; station operated and controlled by R. C. of A.
- MARGARET (KUQS).—Station operated and controlled by owner of vessel.
- METAPAN.—Range, 300.
- NEW ROCHELLE.—Name changed to Hudson.
- NORTH WIND.—Frank W. Frueauff owner of vessel.
- NUSHAGAK.—System, Marconi, 1,000; service, PG and PR; hours, N and X; rates, North and South American service 8 c. per word.

- OHONKARA.—Station operated and controlled by owner of vessel.
 OLDHAM.—Station operated and controlled by I. W. T. Co.
 REDWOOD.—Range, 300; hours, N and X; rates, transoceanic 8 c. per word.
 SANTA ANA (WAL).—Hours, N and X.
 SANTA LUISA.—Range, 300.
 SEAFARER.—R. Bean owner of vessel.
 SEEBANDER.—System, R. C. of A., 1,000.
 SELMA CITY.—Range, 300; system, Marconi, 1,000; w. l., 300, 450, 600; hours, X; rates, North and South American and transoceanic services 8 c. per word.
 SIALIA.—System, Cutting & Washington, 1,000, also Deforest radiophone; w. l., 300, 450, 600—phone 400; rates; North and South American, transoceanic and Great Lakes services, 4 c. per word; station operated and controlled by owner of vessel.
 STAR OF GREENLAND.—Station operated and controlled by owner of vessel.
 STAR OF LAPLAND.—Station operated and controlled by owner of vessel.
 SUNSHINE.—Range, 300; system, Navy-Marconi, 1,000; w. l., 300, 450, 600.
 SURINAME.—Range, 200; system, Wireless Specialty Apparatus Co., 1,000; w. l., 300, 450, 600.
 SWIFTLIGHT.—Range, 300; system, R. C. of A., 1,000; w. l., 300, 450, 600; rates, North and South American and transoceanic services 8 c. per word; station operated and controlled by R. C. of A.
 TAMPICO.—Station operated and controlled by owner of vessel.
 TATOOSH.—Henry C. Peterson owner of vessel.
 THOROBRED.—Service, PG; hours, X; Dutee W. Flint owner of vessel.
 TULSAGAS.—Station operated and controlled by S. O. R. S.
 VESTA.—Range, 300.
 VIGILANT.—Station operated and controlled by owner of vessel.
 WESTLAND.—System, Navy-Marconi, 1,000.
 WESTWOOD.—W. l., 300, 450, 600; hours, N.
 WHITEMARSH.—E. W. Marland owner of vessel.
 WILLIAM M. MILLS.—Station operated and controlled by owner of vessel.
 WILLIAM N. PAGE.—System, Navy-Lowenstein, 1,000; w. l., 300, 450, 600.
 WISLA.—Range, 275; system, English Marconi, 560; w. l., 300, 450, 600.
 W. L. STEED.—W. l., 300, 450, 600.
 WYANDOTTE (WCO).—Range, 150; system, R. C. of A., 1000.
 Strike out all particulars of the following-named vessels:

Abbeville.	Asotin.	Bobring.	Caponka.
Aberdeen.	Aspenhill.	Bockonoff.	Caribou.
Acrema.	Astoria.	Bologan.	Cartona.
Aculeo.	Awensdaw.	Bon Secour.	Casmalia.
Afrania.	Baganito.	Boone.	Catawba.
Agria.	Bagoso.	Borad.	Cheron.
Ahala.	Baladan.	Botsford.	Chibiabos.
Aiken.	Balosaro.	Boulton.	Clodia.
Almwell.	Balsto.	Boykin.	Conewago.
Alapaha.	Banago.	Boynton.	Coot.
Albatross.	Battahatchee.	Braeburn.	Corone.
Alcis.	Battonville.	Brant.	Corvallis.
Alderman.	Baxley.	Braxton.	Coweta.
Allison.	Bayou Teche.	Bromela.	Cresap.
Alpaco.	Bedminster.	Brompton.	Cruso.
Alta.	Belding.	Broncho.	Cumberland.
Amoron.	Belott.	Brookwood.	Curlew.
Andra.	Benzonia.	Buhisan.	Daca.
Angelina.	Berea.	Bulana.	Dalgada.
Anthera.	Blakeley.	Bushrod.	Danvers.
Arado.	Blandon.	Cabeza.	Datis.
Arambi.	Blue Eagle.	Calala.	Dertona.
Ardena.	Blythedale.	Campello.	Diana.

Dungeness.	Hokah.	Moraine.	Sea Bird.
Esopus.	Horado.	Moritz.	Sheldrake.
Eyota.	Issaquena.	Musketo.	Snipe.
Falmouth.	Itasca.	Nashotah.	Sturgeon Bay.
Fassett.	Jamaica.	Neeolah.	Swampscott.
Fernandina.	Kanakee.	Newton (KIRC).	Tanka.
Fish Hawk.	Kasota.	Northbend.	Teal.
Flavel.	Katia.	Obak.	Tern.
Folsom.	Kenosha.	Oglethorpe.	Toka.
Fonduco.	Kimta.	Okiya.	Tuwetanka.
Forster.	Kingfisher (KOQR).	Oraton.	Tyee (KENB).
Fort Leavenworth.	Klamath.	Osprey.	Wakan.
Fort Russell.	La Forge.	Owatama.	Wakanna.
Fort Sill.	Lone Star.	Panga.	Wakiki.
Fort Smith.	Lonoke.	Pascagoula.	Waneyanda.
Fort Wright.	Loon.	Penguin.	Wasco.
Governor.	Mahnet.	Plover.	Wayhut.
Gray Eagle.	Makanda.	Quemakoning.	Wenakee.
Grayling.	Maratanza.	Quidnic.	Widgeon.
Grebe.	Marshfield.	Quinault (KNEI).	Wild Goose.
Harish.	Mattapan.	Quinnesece.	Wonahbe.
Haverhill.	Medford.	Redlands.	Woyaca.
Heron.	Medric.	Sapona.	Zenith.
Himoto.	Mono.	Saris.	

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDCI, *read* Hudson. Strike out all particulars following the call signals, KDJA, KEBK, KEBL, KECC, KECT, KECZ, KEDB, KEDC, KEDD, KEFF, KELD, KELJ, KELV, KEMC, KEMR, KENB, KENL, KEPB, KEPX, KEQQ, KESF, KETD, KETF, KETK, KETR, KETT, KEVL, KEZT, KFM, KGB, KIBS, KIBT, KIBX, KICB, KICF, KICG, KICJ, KICT, KICX, KIDK, KIFF, KIFS, KIFT, KIGV, KIKV, KILB, KILC, KILD, KIRC, KISB, KJOI, KKIA, KKEA, KKIE, KKII, KKIO, KKOU, KLAI, KLN, KMOU, KNEI, KNII, KNIO, KNOE, KNUA, KOLG, KOMJ, KOQR, KOSB, KOSK, KOSP, KOSZ, KOTC, KOTS, KPAE, KPAO, KPAU, KPEI, KPEU, KPIA, KPIU, KPOA, KPOI, KPUA, KPUE, KPUO, KQAO, KRAI, KRAO, KRAU, KRIE, KROA, KRUA, KRUE, KSEO, KTEO, KUDB, KUDF, KUFL, KUFM, KUFQ, KUFs, KUFT, KUFx, KUGF, KUGJ, KUJM, KUJN, KUMJ, KURQ, KVEE, KVEU, KZE, KZUA, KZUO, WBII, WBIO, WBIU, WBOA, WBOU, WCOA, WCAA, WCAO, WCEI, WCEO, WDAE, WDAI, WDEE, WDUE, WGAU, WGIO, WGR, WGUE, WGUU, WJAE, WJEU, WJUW, WKIA, WKOE, WKOI, WLB, WLIU, WLOA, WLUE, WMOI, WMOO, WMOU, WMUW, WNEU, WNIA, WNOU, WNUA, WNUE, WNUI, WPAA, WPB, WPOE, WPOI, WQAI, WQIE, WQIU, WQOO, WQUI, WRIU, WRUE, WRUI, WRUU, WSAU, WSLA, WSIE, WSII, WTAU, WTIA, WTOA, WTOE, WVEO, WVII, WVUI, WVUO, WVUU, WXIE, WXII, WXIU, WXUU, WZAI, WZAO, WZUU.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920.]

SEA GATE, N. Y. (NAH).—Strike out all particulars.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920.]

Strike out all particulars of the following-named vessels:

Astoria.	S. C. 72.	S. C. 182.	S. C. 262.
Canonicus.	S. C. 73.	S. C. 184.	S. C. 265.
Castine.	S. C. 74.	S. C. 187.	S. C. 266.
Eagle 25.	S. C. 77.	S. C. 193.	S. C. 268.
G-1.	S. C. 95.	S. C. 194.	S. C. 269.
Samoa.	S. C. 96.	S. C. 196.	S. C. 272.
S. P. 609 (Nokomis).	S. C. 105.	S. C. 206.	S. C. 282.
S. C. 17.	S. C. 109.	S. C. 208.	S. C. 288.
S. C. 19.	S. C. 110.	S. C. 211.	S. C. 291.
S. C. 21.	S. C. 111.	S. C. 212.	S. C. 296.
S. C. 24.	S. C. 116.	S. C. 213.	S. C. 304.
S. C. 25.	S. C. 117.	S. C. 215.	S. C. 307.
S. C. 26.	S. C. 118.	S. C. 216.	S. C. 309.
S. C. 35.	S. C. 120.	S. C. 217.	S. C. 322.
S. C. 37.	S. C. 123.	S. C. 218.	S. C. 329.
S. C. 40.	S. C. 126.	S. C. 220.	S. C. 331.
S. C. 42.	S. C. 129.	S. C. 221.	S. C. 336.
S. C. 43.	S. C. 129.	S. C. 226.	S. C. 338.
S. C. 44.	S. C. 133.	S. C. 228.	S. C. 339.
S. C. 45.	S. C. 134.	S. C. 230.	S. C. 351.
S. C. 46.	S. C. 135.	S. C. 235.	S. C. 352.
S. C. 47.	S. C. 136.	S. C. 236.	S. C. 354.
S. C. 48.	S. C. 138.	S. C. 238.	S. C. 356.
S. C. 49.	S. C. 144.	S. C. 239.	S. C. 421.
S. C. 50.	S. C. 148.	S. C. 245.	S. C. 422.
S. C. 51.	S. C. 164.	S. C. 246.	S. C. 423.
S. C. 52.	S. C. 165.	S. C. 248.	S. C. 428.
S. C. 53.	S. C. 166.	S. C. 250.	S. C. 429.
S. C. 54.	S. C. 167.	S. C. 254.	S. C. 430.
S. C. 55.	S. C. 168.	S. C. 255.	Supply.
S. C. 59.	S. C. 178.	S. C. 257.	Yankton.
S. C. 68.	S. C. 180.	S. C. 258.	Yorktown.
S. C. 70.	S. C. 181.	S. C. 259.	

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals, NABR, NAH, NAMM, NCS, NDA, NEKK, NGM, NIQF, NIQG, NIQJ, NOBJ, NOBL, NOBN, NOBR, NOBS, NOBT, NOBZ, NOCC, NOCG, NOCK, NOCL, NOCM, NOCN, NOCP, NOCQ, NOCR, NOCS, NOCT, NOCV, NOCX, NOCZ, NODB, NODC, NODD, NODQ, NODS, NODV, NODX, NODZ, NOFB, NOGB, NOGC, NOGP, NOGT, NOGV, NOGX, NOJF, NOJG, NOJJ, NOJL, NOJP, NOJS, NOJV, NOJX, NOKD, NOKF, NOKG, NOKJ, NOKL, NOKP, NOKS, NOLL, NOLM, NOLN, NOLP, NOLQ, NOLS, NOLV, NOLX, NOLZ, NOMC, NOMG, NOMP, NOMQ, NOMS, NONJ, NONL, NONP, NONQ, NONR, NONT, NONV, NONX, NONZ, NOPB, NOPC, NOPK, NOPM, NOPP, NOPV, NOPX, NOQB, NOQC, NOQK, NOQL, NOQN, NOQP, NOQT, NOQV, NOQZ, NORB, NORC, NORG, NORL, NORM, NORP, NORQ, NORT, NOSK, NOSR, NOSV, NOTD, NOTP, NOTS, NOTV, NOVF, NOVJ, NOVR, NOVZ, NOXC, NOXD, NOXQ, NOXR, NOXT, NOXX, NOZT, NOZV, NOZX, NQX, NSK, NTK, NXY.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

LAWRENCE, KANS. (9YN).—Strike out all particulars.
 NEW YORK, N. Y. (2XK).—Superadio Corporation, owner of station.
 NORFOLK, VA. (3YD).—Strike out all particulars.
 SANTA BARBARA, CALIF. (6ZY).—Strike out all particulars.

MISCELLANEOUS.

OPERATORS' LICENSES SUSPENDED.

First-grade license No. 19920, issued at Baltimore, January 6, 1920, has been suspended for a period of three months on account of the holder of the license violating article 6 of the International Convention service regulations, in that he transmitted superfluous signals.

First-grade license No. 24055, issued at San Francisco, May 26, 1920, has been suspended for a period of one month on account of the holder of the license violating article 6 of the International Convention service regulations, in that he transmitted superfluous signals.

First-grade license No. 18101, issued at Seattle, July 28, 1919, has been suspended for a period of three months on account of the holder of the license violating article 6 of the International Convention service regulations, in that he transmitted superfluous signals.

First-grade license No. 19675 issued at Boston, October 30, 1919, has been suspended for a period of three months on account of the holder of the license violating article 6 of the International Convention service regulations, in that he transmitted superfluous signals.

DISTRIBUTION OF WEATHER INFORMATION BY NAVAL RADIO STATIONS.

In cooperation with the Office of Communications of the Navy Department the United States Weather Bureau will issue a special bulletin containing surface observations from regular Weather Bureau stations, upper-air observations from aerological stations maintained by the Navy, Army, and Weather Bureau, and a summary of weather conditions, forecasts, and warnings. The bulletin is for the benefit of marine and aviation interests, but is designed especially to meet the needs of the latter. The bulletin will begin June 1, 1921, and will be broadcasted from the naval radio station at Arlington, Va., each morning at 10.30 o'clock (75th meridian time), Sundays and holidays included. This service is in addition to the distribution now being made each night from the naval radio stations at Arlington, Va., Key West, Fla., Point Isabel, Tex., Great Lakes, Ill., and San Juan, P. R., as described in Weather Bureau circular of October 26, 1920.—*From Hydrographic Bulletin, June 1, 1921.*

INTERFERENCE BY EXPERIMENTAL STATIONS.

It has been reported to the Bureau that some stations, presumably experimenting, use their transmitters without giving their call signal, as required in regulations 76 and 77.

UNITED STATES DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU, WASHINGTON.

Forecast Division.

Local distribution of forecasts, storm and hurricane warnings, and weather information by naval radio stations.

[In cooperation with Office of Communications of the Navy Department.]

Beginning June 10, 1921, there will be a systematic broadcasting of wind and weather forecasts, storms and hurricane warnings, and advices relating thereto from naval radio stations on the south Atlantic and Gulf coasts, in the Caribbean Sea, and on the Great Lakes. This distribution will be in the nature of a localized service, and supplemental to the general broadcasting of weather forecasts, warnings, and bulletins from the high-powered naval radio stations at Arlington, Va., Key West, Fla., San Juan, P. R., Point Isabel, Tex., and Great Lakes, Ill., as described in Weather Bureau circulars of October 26, 1920, and May 16, 1921.

The table below shows the naval radio stations from which distribution will be made, their transmitting wave lengths, call letters, the information which will be broadcast

therefrom, the hours of distribution (75th meridian time), and the Weather Bureau stations from which the forecasts and information will be supplied.

Whenever storm or hurricane warnings are issued in the forenoon (based on 8 a. m. observations) they will be broadcast at the same time as the wind and weather forecasts. When issued in the afternoon (based on special observations), they will be broadcast at the evening hours indicated.

Vessel owners and others desiring to receive these reports should make every effort to obtain them on regular schedules, as repetitions, except as indicated, will be made only in unusual circumstances.

Additional copies of the circular may be obtained by application to any Weather Bureau office named in the table or to Chief, U. S. Weather Bureau, Washington, D. C.

Naval radio stations.			Weather information broadcast.	Broadcasting time (75th meridian).	Weather Bureau stations issuing information.
Location.	Transmitting wave.	Call letters.			
Portland, Me.....	1,620	NAB	(a) Wind and weather forecasts and storm warnings for Maine coast, Eastport to Portsmouth; advisory messages regarding storm warnings issued for north Atlantic coast; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Portland. (b) Storm warnings and advices issued in afternoon.	(a) Noon..... (b) 8 p. m.	Portland, Me.
Boston, Mass.....	2,250	NAD	(a) Wind and weather forecasts and storm warnings for New Hampshire, Massachusetts, and Rhode Island coasts; advisory messages regarding storm warnings issued for north Atlantic coast; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Highland Light, Nantucket, and Block Island. (b) Storm warnings and advices issued in afternoon.	(a) 11 a. m.... (b) 5 p. m.	Boston, Mass.
New York, N. Y..	1,832	NAH	(a) Wind and weather forecasts and storm warnings for New York and Connecticut coasts; forecasts Sandy Hook to Grand Banks for European steamers; advisory messages regarding storm warnings issued for north and middle Atlantic coasts; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Sandy Hook. (b) Storm warnings and advices issued in afternoon.	(a) 10.30 a. m.. (b) 5 p. m.	New York, N. Y.
Philadelphia, Pa.	1,948	NAI	(a) Wind and weather forecasts and storm warnings for New Jersey, Delaware, and Maryland coasts; advisory messages regarding storm warnings issued for north and middle Atlantic coasts; and 8 a. m. wind direction and velocity and state of weather at Delaware Breakwater. (b) Storm warnings and advices issued in afternoon.	(a) 10.45 a. m.. (b) 5 p. m.	Philadelphia, Pa.
Baltimore, Md.....	700	NBZ	(a) Wind and weather forecasts and storm warnings for Chesapeake Bay; advisory messages regarding storm warnings issued for middle and south Atlantic coasts; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Baltimore and Norfolk. (b) Storm warnings and advices issued in afternoon.	(a) 10.30 a. m.. (b) 4 p. m.	Baltimore, Md.

Naval radio stations.			Weather information broadcast.	Broadcasting time (75th meridian).	Weather Bureau stations issuing information.
Location.	Transmitting wave.	Call letters.			
Norfolk, Va.....	1,851	NAM	(a) Wind and weather forecasts and storm warnings for Virginia and North Carolina coasts; advisory messages regarding storm warnings issued for Chesapeake Bay and middle and south Atlantic coasts. (b) Storm warnings and advices issued in afternoon. (c) Advisory messages regarding hurricanes. (d) 8 a. m. and 8 p. m. barometric pressure, state of weather, wind direction and velocity, condition of sea, and visibility at Cape Henry and Cape Hatteras.	(a) 10.45 a. m.. (b) 4 p. m. 8 p. m. (c) When issued and repeated at 2-hour intervals until midnight. (d) 8.30 a. m. and 8.30 p. m.	Cape Henry, Va.
Charleston, S. C. .	2,250	NAO	(a) Wind and weather forecasts and storm warnings for South Carolina coast; advisory messages relating to storm warnings issued for middle, south Atlantic, and east Gulf coasts; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Charleston. (b) Storm warnings and advices issued in afternoon. (c) Hurricane warnings and advisory messages relating thereto.	(a) 10.30 a. m.. (b) 6 p. m. (c) When issued and repeated at 2-hour intervals until midnight.	Charleston, S. C. .
Savannah, Ga.	1,813	NEV	(a) Wind and weather forecasts and storm and hurricane warnings for Georgia coast; advisory messages relating to storm warnings issued for middle and south Atlantic and east Gulf coasts; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Savannah. (b) Storm warnings and advices issued in afternoon. (c) Hurricane warnings and advisory messages relating thereto.	(a) 11 a. m. (b) 6 p. m. (c) When issued and repeated at 2-hour intervals until midnight.	Savannah, Ga.
Jacksonville, Fla.	450	NFI	(a) Wind and weather forecasts and storm and hurricane warnings for east Florida coast, Jacksonville to Miami; advisory messages relating to storm warnings issued for middle and south Atlantic and east Gulf coasts; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Jacksonville and Titusville. (b) Storm warnings and advices issued in afternoon. (c) Hurricane warnings and advisory messages relating hereto.	(a) 11 a. m. (b) 6 p. m. (c) When issued and repeated at 2-hour intervals until 7 p. m.	Jacksonville, Fla.

Naval radio stations.			Weather information broadcast.	Broadcasting time (75th meridian).	Weather Bureau stations issuing information.
Location.	Transmitting wave.	Call letters.			
St. Augustine, Fla.	1,851	NAP	(a) Wind and weather forecasts and storm warnings for east Florida coast, Jacksonville to Miami; advisory messages relating to storm warnings issued for middle and south Atlantic and east Gulf coasts; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Jacksonville and Titusville. (b) Storm warnings and advices issued in afternoon. (c) Hurricane warnings and advisory messages relating thereto.	(a) 11.30 a. m.. (b) 7 p. m. (c) When issued and repeated at 2-hour intervals until midnight.	Jacksonville, Fla.
Miami, Fla.	1,620	NGE	(a) Wind and weather forecasts and storm warnings for east coast of Florida, Miami to Key West; advisory messages relating to storm warnings issued for the middle and south Atlantic and east Gulf coasts; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Miami. (b) Storm warnings and advices issued in afternoon. (c) Hurricane warnings and advisory messages relating thereto.	(a) 11.30 a. m.. (b) 6 p. m. (c) When issued and repeated at 2-hour intervals until midnight.	Miami, Fla.
St. Petersburg, Fla.	2,700	NGL	(a) Wind and weather forecasts and storm warnings for west Florida coast, Key West to Apalachicola; advisory messages relating to storm warnings issued for the south Atlantic and Gulf coasts; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Tampa and Key West. (b) Storm warnings and advices issued in afternoon. (c) Hurricane warnings and advisory messages relating thereto.	(a) 11.30 a. m.. (b) 7 p. m. (c) When issued and repeated at 2-hour intervals until midnight.	Tampa, Fla.
Pensacola, Fla.	2,250	NAS	(a) Wind and weather forecasts and storm warnings for Florida and Alabama coasts, Apalachicola to Bay St. Louis; advisory messages relating to storm warnings issued for south Atlantic and Gulf coasts; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Pensacola. (b) Storm warnings and advices issued in afternoon. (c) Hurricane warnings and advisory messages relating thereto.	(a) 11.45 a. m.. (b) 6 p. m. (c) When issued and repeated at 2-hour intervals until midnight.	Pensacola, Fla.

Naval radio stations.			Weather information broadcast.	Broadcasting time (75th meridian).	Weather Bureau stations issuing information.
Location.	Transmitting wave.	Call letters.			
New Orleans, La.	1,832	NAT	(a) Wind and weather forecasts and storm warnings for Louisiana and Texas coasts, Bay St. Louis to Port Arthur; advisory messages relating to storm warnings issued for south Atlantic and Gulf coasts; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Burrwood and Port Arthur. (b) Storm warnings and advices issued in afternoon. (c) Hurricane warnings and advisory messages relating thereto.	(a) 11 a. m. (b) 5 p. m. (c) When issued and repeated at 2-hour intervals until midnight.	New Orleans, La.
Galveston, Tex...	1,813	NKB	(a) Wind and weather forecasts and storm warnings for Texas coast, Port Arthur to Corpus Christi; advisory messages relating to storm warnings issued for the west Gulf coast; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Galveston. (b) Storm warnings and advices issued in afternoon. (c) Hurricane warnings and advisory messages relating thereto.	(a) 11.30 a. m. (b) 6 p. m. (c) When issued and repeated at 2-hour intervals until midnight.	Galveston, Tex.
Point Isabel, Tex.	2,250	NAY	(a) Wind and weather forecasts and storm warnings for Texas coast, Corpus Christi to Brownsville; advisory messages relating to storm warnings issued for the west Gulf coast. (b) Storm warnings and advices issued in afternoon. (c) Hurricane warnings and advisory messages relating thereto.	(a) Noon..... (b) 7 p. m. (c) When issued and repeated at 2-hour intervals until midnight.	New Orleans, La.
Alpena, Mich.....	1,200	NSM	(a) Wind and weather forecasts and storm warnings for Lake Huron; advisory messages relating to storm warnings issued for the Great Lakes. (b) Storm warnings and advices issued in afternoon. (c) State of weather, wind direction and velocity, and condition of sea at 8 a. m. at Mackinaw, Middle Island, Alpena, Tawas, Harbor Beach, and Port Huron (barometric pressure Alpena and Port Huron included).	(a) 11.45 a. m. (b) 4.45 p. m. 7.45 p. m. (c) 10.45 a. m.	Alpena, Mich.
Buffalo, N. Y.....	1,200	NNZ	(a) Wind and weather forecasts and storm warnings for Lake Ontario; advisory messages relating to storm warnings issued for the Great Lakes; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Buffalo and Oswego. (b) Storm warnings and advices issued in afternoon.	(a) 10.45 a. m. (b) 5 p. m.	Buffalo, N. Y.

Naval radio stations.			Weather information broadcast.	Broadcasting time (75th meridian).	Weather Bureau stations issuing information.
Location.	Transmitting wave.	Call letters.			
Cleveland Ohio...	1,080	NRH	(a) Wind and weather forecasts and storm warnings for Lake Erie; advisory messages relating to storm warnings issued for the Great Lakes; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Toledo and Erie. (b) Storm warnings and advice issued in afternoon.	(a) 11 a. m.... (b) 5.30 p. m.	Cleveland, Ohio.
Chicago, Ill.	1,200	NUR	(a) Wind and weather forecasts and storm warnings for Lake Michigan; advisory messages relating to storm warnings issued for the Great Lakes; and 8 a. m. wind direction and velocity and state of weather at Beaver Island, Plum Island, and Chicago (barometric pressure Chicago included). (b) Storm warnings and advice issued in afternoon.	(a) 11 a. m.... (b) 5.30 p. m.	Chicago, Ill.
Duluth, Minn.	2,200	NUX	(a) Wind and weather forecasts and storm warnings for Lake Superior; advisory messages relating to storm warnings issued for the Great Lakes; and 8 a. m. barometric pressure, wind direction and velocity, and state of weather at Duluth and Sault Ste. Marie. (b) Storm warnings and advice issued in afternoon.	(a) 10.45 a. m.. (b) 4.45 p. m.	Duluth, Minn.
Guantanamo, Cuba.	2,750	NAW	All hurricane warnings and advisory messages relating thereto whenever issued.	When issued and repeated at about 4-hour intervals.	Washington, D. C.
Port au Prince, Haiti.	2,250	NSC	do.....	do.....	Do.
San Jaun, P. R.	2,750	NAU	do.....	do.....	San Jaun, P. R.
St. Thomas, V. I.	1,688	NBB	do.....	do.....	Do.
St. Croix, V. I.	450	NNI	do.....	do.....	Do.

C. F. MARVIN,
Chief of Bureau.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, August 1, 1921—No. 52

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name =Name of station.
- G. loc. =Geographical location: O=west longitude, N=north latitude, S=south latitude.
- Call =Call letters assigned.
- System =Radio system used and sparks per second.
- Range =Normal range in nautical miles.
- W. L. =Wave lengths assigned: Normal wave lengths in italics.
- Service =Nature of service maintained:
- PG=General public.
- PR=Limited public.
- P =Private.
- O =Government business exclusively.
- Hours =Hours of operation:
- N =Continuous service.
- X =No regular hours.
- m =a. m. (12 m=midday).
- s =p. m. (12s=midnight).
- Rates =Ship or coast charges in cents; c=cents. (The rates in the international list are given in francs and centimes.)
- I. W. T. Co.=Independent Wireless Telegraph Co.
- R. C. of A.=Radio Corporation of America.
- S. O. R. S.=Ship Owners' Radio Service.
- Co. =Company.
- Corp. =Corporation.
- & =And.
- Do. =Ditto.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Norfolk, Va. ¹	WPT	300,475,600	PR	X	City of Norfolk.
Toledo, Ohio ²	WQC	275,300,350,600	PR	.....	Central States Radio Service.

¹ Loc. (approximately) O 78° 15' 30", N 36° 51' 00"; range, 150; system, Telefunken, 1000; rates, none.

² Loc. (approximately) O 83° 31' 00", N 41° 40' 00"; range, 75; system, composite, 240; hours, 8.30 a.m. to 6 p.m.; rates, to Detroit 2 c per word; minimum 10 words, 20 c.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
Adler.....	KD TT			PG	X	Coronal Coal Co.....	
American Legion.....	KD TM	4	4	PG	N	U. S. S. B.....	S. O. R. S.
Bowdoin.....	KD TQ					McMillan Arctic Expedition.	Owner of vessel.
Colonial.....	KD TK			PG	X	Western Reserve Navigation Co.	R. C. of A.
Hamer.....	KD TN	4	4	PG	X	U. S. S. B.....	
J. A. Moffett, Jr.....	KD TU			PG	N	Standard Oil Co. of N. J.	
J. N. Pew.....	KD TP	8	8	PG	X	Sun Co.....	R. C. of A.
Liberty Glo ²	KI QZ	4	4	PG	X	U. S. S. B.....	I. W. T. Co.
Memphis City.....	KD TR			PG	N	U. S. Steel Products Co.	
Nevada II.....	KD TL					J. F. Lowcock.	
Thomas P. Beal.....	KD TO			PG	X	Crowell & Thurlow S. S. Co.	
Tustem.....	KD TW						
West Greylock.....	KD TV	4	4	PG	N	U. S. S. B.....	

¹ Range, 150; system, R. C. of A., 1000; w.l., 300, 600; rates, Great Lakes service 2 c per word.

² System, Wireless Specialty Apparatus Co., 1000; w.l., 300, 600.

Commercial land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KD TK...	Colonial.....b	KD TT...	Adler.....b
KD TL...	Nevada II.....b	KD TU...	J. A. Moffett, Jr.....b
KD TM...	American Legion.....b	KD TV...	West Greylock.....b
KD TN...	Hamer.....b	KD TW...	Tustem.....b
KD TO...	Thomas P. Beal.....b	KI QZ...	Liberty Glo.....b
KD TP...	J. N. Pew.....b	WPT...	Norfolk, Va.....c
KD TQ...	Bowdoin.....b	WQC...	Toledo, Ohio.....c
KD TR...	Memphis City.....b		

Government land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Iowa City, Iowa.....	KDTS	Post Office Department.

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1920, only.]

Station.	Call signal.	Station controlled by—
Abilene, Tex.....	5YN	Simmons College.
Baltimore, Md.....	3YR	Polytechnic Institute, city of Baltimore.
Berkeley, Calif.....	6ZAF	A. H. Babcock.
Cambridge, Mass.....	1XO	General Radio Co.
Chicago, Ill.....	9YAK	City of Chicago.
Cincinnati, Ohio.....	8XAA	Crosley Manufacturing Co.
Denver, Colo.....	9ZAF	Wm. D. Reynolds.
Kountze, Tex.....	5ZAJ	Arthur H. Holt.
Middletown, Conn.....	1XAC	Wesleyan University.
New Orleans, La.....	5XQ	Pendleton E. Lehde.
Oakland, Calif.....	6XAJ	Preston D. Allen.
Parkersburg, W. Va.....	3XW	Horace A. Beale, Jr.
Pawtucket, R. I.....	1XAD	Standard Radio & Electric Co.
Portland, Oreg.....	7ZT	G. B. Critser.
Pullman, Wash.....	7ZS	Hugh E. Allen.
San Francisco, Calif.....	6ZAG	Clyde C. Young.
San Francisco, Calif.....	6ZAH	Boy Scouts of America.
San Francisco, Calif.....	6ZAI	Do.
Spring Glen, Fla.....	4ZE	James C. Kellow.
Washington, D. C.....	3XZ	Radio Construction Co.
Washington, D. C.....	3ZY	Lawrence M. Dunnan.

Special land stations grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
1XAC	First district:		Sixth district:
1XAD	Middletown, Conn.....	6ZAF	Berkeley, Calif.
1XO	Pawtucket, R. I.....	6ZAG	San Francisco, Calif.
	Cambridge, Mass.....	6ZAH	San Francisco, Calif.
	Third district:	6ZAI	San Francisco, Calif.
3XW	Parkersburg, W. Va.....	6XAJ	Oakland, Calif.
3XZ	Washington, D. C.....		Seventh district:
3YR	Baltimore, Md.....	7ZS	Pullman, Wash.
3ZY	Washington, D. C.....	7ZT	Portland, Oreg.
4ZE	Fourth district: Spring Glen, Fla.....	8XAA	Cincinnati, Ohio.
	Fifth district:		Ninth district:
5XQ	New Orleans, La.....	9YAK	Chicago, Ill.
5YN	Abilene, Tex.....	9ZAF	Denver, Colo.
5ZAJ	Kountze, Tex.....		

ALTERATIONS AND CORRECTIONS.**COMMERCIAL LAND STATIONS.**

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

BURRWOOD, LA.—Rates, between New Orleans, La., and Burrwood, La., minimum charge \$1 for 10 words, each additional word 10 c. Address and signature free.

CHEBOYGAN, MICH.—System, composite, 240; w. l., 300, 400, 600.

FALSE PASS, ALASKA.—P. E. Harris & Co., owner of vessel.

DEARBORN, MICH.—Range, 150.

HILLSBORO, OREG.—Range, 1000; system, Federal arc.

JOHNSWOOD, MICH.—Range, 50.

NEW ORLEANS, LA.—Rates, between Burrwood, La., and New Orleans, La., minimum charge \$1 for 10 words, each additional word 10 c. Address and signature free.

NORTHVILLE, MICH.—Range, 50; w. l., 300, 380, 500, 600.

PALO ALTO, CALIF.—Range, 1000; system, Federal arc.

SAN FRANCISCO, CALIF. (KHH).—Range, 100; system, composite, 1000.

TUCKERTON, N. J.—W. l., 300, 600, 16000.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1920, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ALA.—Station operated and controlled by R. C. of A.

A. M. BYERS.—Range, 200.

ASHTABULA.—System, R. C. of A., 1000.

AMERICAN.—Range, 300; system, Navy-Liberty, 1000; w. l., 300, 450, 600; hours, N; U. S. Shipping Board owner of vessel.

ANNETTE ROLPH.—Rates, North and South American service 8 c per word.

ANNISTON.—Station operated and controlled by R. C. of A.

ARCADIA.—Station operated and controlled by R. C. of A.

ARDMORE.—Range, 300; system, R. C. of A. 1000.

ARIZPA.—Station operated and controlled by R. C. of A.

ASKAWAKE.—Station operated and controlled by I. W. T. Co.

ASTRAL.—Range, 300.

AVALON (KIZL).—Rates, North and South American service 8 c per word.

BAY HEAD.—Station operated and controlled by R. C. of A.

BANNACK.—Station operated and controlled by R. C. of A.

BETTY R.—Range, 50; system, Deforest; Edward C. Crossett owner of vessel.

BLUE HEN STATE.—Station operated and controlled by I. W. T. Co.

CAMBRIDGE.—Range, 75; hours, N.

CAPILLO.—Station operated and controlled by R. C. of A.

CARACAS.—Range, 300.

CASCO.—Station operated and controlled by R. C. of A.

CELILO.—Station operated and controlled by owner of vessel.

CENTENNIAL STATE.—Range, 300; system, Independent arc; w. l., 300, 600, 1800.

CITY OF FREEPORT.—Station operated and controlled by R. C. of A.

CITY OF LOWELL.—Range, 75.

CITY OF ROCKLAND.—Range, 150; system, R. C. of A., 1000.

CITY OF SEATTLE.—Pacific S. S. Co. owner of vessel.

CITY OF TAUNTON.—Range, 75.

CLAREMONT.—Rates, North and South American service, 8 c per word.

COASTWISE.—Range, 300; system, Navy-R. C. of A., 1000; w. l., 300, 450, 600.

COLD HARBOR.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.

COLUSA.—Station operated and controlled by R. C. of A.

CONNESSE PEAK.—Station operated and controlled by R. C. of A.

CRANFORD.—Station operated and controlled by I. W. T. Co.

CREOLE.—W. l., 300, 600.

CRETAN.—Rates, transoceanic service, 8 c per word.

DECATUR BRIDGE.—System, Navy-Marconi, 1000; w. l., 300, 450, 600.

DELPINE (KIFL).—System, R. C. of A., 1000; w. l., 300, 600.

DIXIANO.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.

DORCHESTER.—Range, 150; hours, N.

- DUNSYRE.**—Rates, North and South American and transoceanic services, 8 c per word; station operated and controlled by owner of vessel.
- EASTERN SOLDIER.**—Station operated and controlled by R. C. of A.
- EASTERN VICTOR.**—Station operated and controlled by R. C. of A.
- EL ALMIRANTE.**—Range, 150.
- EL SEGUNDO.**—Range, 300; system, R. C. of A., 480.
- EMPIRE STATE.**—Range, 2000; system, Federal arc, w. l., 300, 450, 600, 1800.
- ERNEST H. MYER.**—Station operated and controlled by owner of vessel.
- EVERETT (KUQR).**—Rates, North and South American service, 8 c per word.
- EVERETT (KZT).**—Range, 300; w. l., 300, 450, 600.
- FAIRMONT.**—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
- FRANK G. DRUM.**—Rates, North and South American and transoceanic services, 8 c per word; station operated and controlled by owner of vessel.
- FRANKLIN (WFF).**—System, R. C. of A., 1000.
- FRED BAXTER.**—Rates, North and South American and transoceanic services, 8 c per word.
- GEORGE WASHINGTON.**—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.
- GEORGINA ROLPH.**—Rates, North and South American service, 8 c per word.
- GOLD SHELL.**—Range, 300; system, R. C. of A., 1000.
- GUARDIAN.**—Service, P; rates, none.
- HAMBRO.**—Range, 300; system, Federal arc; w. l., 300, 600, 1800; station operated and controlled by S. O. R. S.
- HAMPDEN.**—System, Navy-R. C. of A., 1000; w. l., 300, 450, 600.
- HANCOCK COUNTY.**—Range, 200; system, Navy-Simon, 1000; w. l., 300, 600; station operated and controlled by R. C. of A.
- HARTWOOD.**—Rates, North and South American service, 8 c per word.
- HERCULES.**—Rates, North and South American service, 8 c per word; station operated and controlled by owner of vessel.
- HERMAN WINTER.**—Dimon Line owner of vessel.
- H. F. DIMOCK.**—Dimon Line owner of vessel.
- HOMER.**—Rates, North and South American service, 8 c per word.
- HORACE X. BAXTER.**—Rates, North and South American service, 8 c per word; station operated by owner of vessel.
- HYBERT.**—Station operated and controlled by R. C. of A.
- INDIAN BRIDGE.**—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.
- JANELAW.**—Station operated and controlled by S. O. R. S.
- JOHN ENA.**—Rates, North and South American service, 8 c per word; station operated and controlled by owner of vessel.
- JOHN W. WELLS.**—Rates, North and South American service, 8 c per word.
- JULIA LUCKENBACH.**—Range, 300; w. l., 300, 450, 600; rates, North and South American and transoceanic services, 4 c per word.
- KEYSTONE STATE.**—Range, 300; system, Federal arc and Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.
- KOOTENAI.**—Range, 300.
- LAKE FILLMORE.**—Range, 200; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
- LAKE LASANG.**—Station operated and controlled by R. C. of A.
- LEWIS LUCKENBACH.**—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600.
- LIBERTY BELL.**—Station operated and controlled by R. C. of A.
- LIO.**—Station operated and controlled by S. O. R. S.
- LURLINE.**—Range, 300; system, R. C. of A., 1000.
- MANITOU.**—System, R. C. of A., 1000.
- MANULANI.**—W. l., 300, 450, 600.
- MARTHA WASHINGTON.**—Range, 300; system, Telefunken, 1000; w. l., 300, 450, 600.

MELROSE.—W. 1., 300, 450, 600.

MIDDLESEX.—Range, 150; system, R. C. of A., 1000; w. 1., 300, 450, 600.

MOUNT CARROLL.—Range, 300; system, Kilbourne & Clark, 1000; w. 1., 300, 450, 600; rates, transoceanic service 8 c per word; station operated and controlled by owner of vessel.

MULTNOMAH.—Station operated and controlled by owner of vessel.

MUNRIO.—W. 1., 300, 450, 600.

NORFOLK.—Range, 300; system, Navy-R. C. of A., 1000; w. 1., 300, 450, 600.

NORTHERN STAR.—American Star Line owner of vessel.

NORWOOD.—Range, 300; hours, N. and X.

OLDHAM.—Range, 200; system, Marconi, 1000; w. 1., 300, 450, 600.

OTSEGO.—Range, 300; system, Federal arc; w. 1., 300, 450, 600, 1800.

PARAISO.—Rates, North and South American service, 8 c per word.

PARKSVILLE.—Station operated and controlled by R. C. of A.

PASSAIC BRIDGE.—Station operated and controlled by S. O. R. S.

PEARL SHELL.—Range, 300; system, R. C. of A., 1000.

PERSIAN.—Range, 150.

PETER H. CROWELL.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. 1., 300, 450, 600.

PIONEER (KIG).—Range, 300; system, R. C. of A., 1000.

PLAYA.—Union Oil Co. owner of vessel.

POTOMAC.—Range, 200; system, Navy-Marconi, 1000.

PRISCILLA.—Range, 75.

PUGET SOUND.—Station operated and controlled by S. O. R. S.

PULASKI.—Name changed to Pulwico.

QUINAULT (KDND).—Rates, North and South American and transoceanic services, 8 c per word; station operated and controlled by owner of vessel.

RED HOOK.—Erie Basin Towing & Hoisting Co. owner of vessel.

RELAY.—Range, 300; system, Cutting & Washington, 1000; w. 1., 300, 450, 600.

ROSE MAHONEY.—Andrew F. Mahoney Co. owner of vessel.

SAC CITY.—Station operated and controlled by I. W. T. Co.

SACO.—System, Kilbourne & Clark, 1000; w. 1., 300, 450, 600.

SAN ANTONIO.—Rates, North and South American and transoceanic services, 8 c per word.

SAN DIEGO.—Rates, North and South American service, 8 c per word.

SAN LORENZO.—Range, 300.

SANTA ALICIA.—Range, 300; system, R. C. of A., 1000.

SANTA MARTA.—Range, 300.

SANTA RITA (WBR).—System, R. C. of A., 1000.

SENATOR.—Range, 300; system, Marconi, 1000; w. 1., 300, 450, 600.

SIERRA.—Rates, North and South American service, 8 c per word.

SISKIYOU.—Rates, North and South American service, 8 c per word.

STORM KING (KOGM).—Rates, North and South American service 8 c per word.

SUNEWCO.—Station operated and controlled by R. C. of A.

SURICHCO.—Station operated and controlled by R. C. of A.

SUTORFCO.—Station operated and controlled by R. C. of A.

SWIFT EAGLE.—Read Swifteagle; system, R. C. of A., 1000.

SWIFT WIND.—Range, 300; system, R. C. of A., 1000; w. 1., 300, 450, 600; station operated and controlled by R. C. of A.

SYROS.—Station operated and controlled by R. C. of A.

THE HARVESTER.—Range, 150; system, Marconi, 1000; w. 1., 300, 450, 600.

THEODORE ROOSEVELT.—System, R. C. of A., 1000.

WAHKEENA.—Station operated and controlled by owner of vessel.

WAPAMA.—Station operated and controlled by owner of vessel.

WESTERN CHIEF.—Station operated and controlled by R. C. of A.
WEST DUFFEE.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
WEST FARALON.—Station operated and controlled by S. O. R. S.
WEST HELIX.—System, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
WEST KASSON.—Station operated and controlled by I. W. T. Co.
WEST LEWARK.—Station operated and controlled by S. O. R. S.
WEST SEGOVIA.—Station operated and controlled by I. W. T. Co.
WILLAMETTE.—Station operated and controlled by owner of vessel.
WILLIAM PENN.—Station operated and controlled by S. O. R. S.
WILLIMANTIC.—W. l., 300, 450, 600; hours, X.
WM. BOYCE THOMPSON.—Hours, N; Sinclair Navigation Co. owner of vessel.
YALE.—Los Angeles S. S. Co. owner of vessel.
YALZA.—Range, 300; system, Federal arc; w. l., 300, 600, 1800.
YOSEMITE.—Range, 300; w. l., 300, 450, 600.
YUCCA.—Station operated and controlled by R. C. of A.
ZULIA.—Range, 300.

Strike out all particulars of the following-named vessels:

J. B. Stetson.
 Manoa (KOQ).

McClellan.
 Mount Rainier.

Vancolite.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDRK, read Swifteagle; **KUQL**, read Pulwico. Strike out all particulars following the call signals, **KDRG**, **KOQ**, **KYF**, **WSOE**, **WVUE**.

SPECIAL LAND STATION, BY NAME OF STATION.

NORFOLK, VA.—(3ZC).—Strike out all particulars.

MISCELLANEOUS.

NORTH ATLANTIC ICE PATROL DISCONTINUED.

The Ice Patrol and Ice Observation Service was discontinued on June 30, last. (From Hydrographic Bulletin, July 6, 1921.)

CHANGE IN TIME SIGNAL.

The time signal on Kaiser Quay, Hamburg, Germany, is now made at local mean noon, middle European time (15° E. lon.), corresponding to 23 hours Greenwich mean time. (From Hydrographic Bulletin, June 29, 1921.)

RADIO STATION AT MARACAIBO, VENEZUELA.

The work of erecting towers for the new radio station at Maracaibo has been completed and the apparatus is now being installed. It is expected that the installation will be completed the latter part of June, this year. The station is equipped with a 5-kilowatt set with a rotary synchronous spark system. The towers are 164 feet (50 meters) high and the normal sending radius by day will be about 800 miles and by night about 1,600 miles. This station will be open to commercial service.

The Venezuelan Government has already definitely arranged for 7 additional wireless stations to be situated at Maracay, Caracas, Puerto Cabello, La Guaira, San Cristobal, Ciudad Bolivar, and Margarita Island. After all the above-mentioned stations are completed there are to be 16 additional stations installed to provide service for the capital of every State in Venezuela. (From daily Commerce Reports, June 29, 1921.)

FREE DISTRIBUTION OF RADIO SERVICE BULLETIN DISCONTINUED.

All persons, companies, and Government offices who are now receiving this publication are advised that this issue is the last to be furnished free. This order does not affect the various offices of this Department.

Copies of the new list of Commercial and Government Radio Stations of the United States, edition June 30, 1921, which probably will be ready for distribution about October 15 next, may be procured from the Superintendent of Documents, Government Printing Office, this city, at 15 cents per copy. The price of the Radio Service Bulletin is 5 cents per copy; subscription price, 25 cents per year. Subscriptions for these publications should not be addressed to this office, but to the Superintendent of Documents, Government Printing Office, Washington, D. C.

LICENSE SUSPENDED.

License No. 22084 has been suspended for a period of one month for violation of section 13 of the license for the reason that the holder of the license changed the equipment from 300 to 400 meters without being authorized to do so.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, September 1, 1921—No. 53

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name** = Name of station.
- G. loc.** = Geographical location: O = west longitude, N = north latitude.
S = south latitude.
- Call** = Call letters assigned.
- System** = Radio system used and sparks per second.
- Range** = Normal range in nautical miles.
- W. L.** = Wave lengths assigned: Normal wave lengths in italics.
- Service** = Nature of service maintained:
PG = General public.
PR = Limited public.
P = Private.
O = Government business exclusively.
- Hours** = Hours of operation:
N. = Continuous service.
X = No regular hours.
m = a. m. (12m = midday).
s = p. m. (12s = midnight).
- Rates** = Ship or coast charges in cents: c = cents. (The rates in the international list are given in francs and centimes.)
- I. W. T. Co.** = Independent Wireless Telegraph Co.
- R. C. of A.** = Radio Corporation of America.
- S. O. R. S.** = Ship Owners Radio Service.
- Co.** = Company.
- Corp.** = Corporation.
- &** = And.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Bakersfield, Calif. ¹ ...	WJT	300, 400, 600.....	PR	X	Alfred Harrel.
Chichagof, Alaska.....	KRX	.....	.....	.....	Chichagof Mining Co.
Dallas, Tex. ²	WRR	400, 450, 500.....	PR	X	City of Dallas (Police and Fire Signal Dept.).
Detroit, Mich. ³	WQX	275, 300, 350, 600..	PR	(⁴)	Central States Radio Service.
Hartford, Conn. ⁵	WQB	200, 300, 375, 600..	PR	X	C. D. Tuska Co.
Lima, Ohio ⁶	WBY	1700.....	PR	X	Illinois Pipe Line Co.
Seattle, Wash. ⁷	KVW	300, 450, 550, 600..	PR	X	City of Seattle, Light Dept.
Skagit Power Site, Wash. ⁸	WJE	300, 450, 550, 600..	PR	X	Do.
Taft, Calif. ⁹	WJK	300, 400, 600.....	PR	X	Alfred Harrel.

¹ Range, 90; system, composite; rates, none.

² Loc. (approximately) O 96° 47' 00", N 32° 46' 00"; range, 200; system, composite; rates, none.

³ Loc. (approximately) O 83° 03' 30", N 42° 20' 00"; system, composite, 500; rates, 2 c. per word, minimum 10 words, 20 c.

⁴ Hours, 8.30 a. m. to 6 p. m.

⁵ Range, 100; rates, none.

⁶ Loc. (approximately) O 79° 00' 00", N 41° 00' 00"; range, 200; system, Deforest; rates, none.

⁷ Loc. (approximately) O 122° 20' 00", N 47° 37' 00"; range, 200; rates, none.

⁸ Loc. (approximately) O 121° 15' 00", N 48° 40' 00"; range, 200; system, composite; rates, none.

⁹ Range, 90; system, composite (radiophone); rates, none.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
Empire Arrow.....	KDUG	Cents.	Cents.	PG	X	Standard Transportation Co.	Owner of vessel.
Guinevere.....	KDUP	.....	.....	.....	.....	Edgar Palmer.....	
Half Moon.....	KDTY	.....	.....	.....	.....	Gordon Woodbury.....	
Harry Yates ¹	KDUB	.....	.....	PG	X	American S. S. Co.	
John D. Archbold.....	KDUM			PG	N	Standard Oil Co. of N. J.	R. C. of A.
Knoxville City.....	KDUD	.....	.....	PG	X	U. S. Steel Products Co.	
Louis R. Davidson ²	KDUH	.....	.....	PG	X	American S. S. Co.	
Lubrico.....	KDUC	4	4	PG	X	U. S. S. B.	
Octorara ³	WCD			PG	N	Great Lakes Transit Corp.	Owner of vessel.
Patricia ⁴	KDTX	.....	.....	PG	X	James Shewan.....	
Ripple.....	KDUN	.....	.....	PG	X	James T. McAllister...	
Southern Cross.....	KDTZ	4	4	PG	N	U. S. S. B.	
Speeljacks ⁵	KDUF	4	4	P	X	Albert Y. Gowen.....	S. O. R. S.
Theodore H. Wickwire, jr. ⁶	KDUL	.....	.....	PG	X	American S. S. Co.	
West Prospect.....	KDUK	4	4	PG	X	U. S. S. B.	
William T. Roberts ⁷	KDUJ			PG	X	American S. S. Co.	

¹ Range, 150; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 600.

² Range, 150; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 600.

³ Range, 150; system, R. C. of A., 1000; w. l., 300, 450, 600; rates, Great Lakes service, 2 c. per word.

⁴ Range, 130; system, Marconi, 120; w. l., 300, 600.

⁵ Range, 100; system, Deforest; w. l., 300, 450, 600.

⁶ Range, 150; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 600.

⁷ Range, 150; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 600.

Commercial land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
WBY.....	Lima, Ohio.....c	KDUC.....	Lubrico.....b
WCD.....	Octorara.....b	KDUD.....	Knoxville City.....b
WJE.....	Skagit Power Site, Wash.....c	KDUF.....	Spee Jacks.....b
WJT.....	Bakersfield, Calif.....c	KDUG.....	Empire Arrow.....b
WJK.....	Taft, Calif.....c	KDUH.....	Louis R. Davidson.....b
WQB.....	Hartford, Conn.....c	KDUJ.....	William T. Roberts.....b
WQX.....	Detroit, Mich.....c	KDUK.....	West Prospect.....b
WRR.....	Dallas, Tex.....c	KDUL.....	Theodore H. Wickwire, Jr.....b
KDTX.....	Patricia.....b	KDUM.....	John D. Archbold.....b
KDTY.....	Half Moon.....b	KDUN.....	Ripple.....b
KDTZ.....	Southern Cross.....b	KDUP.....	Guinevere.....b
KDUB.....	Harry Yates.....b	KRX.....	Chichagof, Alaska.....c
		KVW.....	Seattle, Wash.....c

Government land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Fort D. A. Russel, Wyo.....	WYCK.....	War Department.
Fort Douglas, Utah.....	WYCY.....	Do.
Jefferson Barracks, Mo.....	WYCL.....	Do.
Memphis, Tenn.....	WYDB.....	Inland & Coastwise Waterways Service, War Department.
New Orleans, La.....	WYDC.....	Do.
Noorvik, Alaska.....	WVM.....	Washington-Alaska Military Cable & Telegraph System.
St. Louis, Mo.....	WYDA.....	Inland & Coastwise Waterways Service, War Department.

Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921.]

Name of ship.	Call signal.	Name of ship.	Call signal.
Baton Rouge ¹	WYDI.....	Natchez ¹	WYDD.....
Cairo ¹	WYDF.....	New Orleans ¹	WYDH.....
Great Northern ²	NAXL.....	Shawnee ²	NIZJ.....
Haida ²	NITF.....	St. Louis ¹	WYDG.....
Memphis ¹	WYDJ.....	Tampa ²	NITC.....
Modoc ²	NIVD.....	Vicksburg ¹	WYDE.....
Mohave ²	NIXB.....		

¹ Operated by Inland & Coastwise Waterways Service, War Department.² Operated by U. S. Navy.³ Operated by U. S. Coast Guard.*Government land and ship stations, alphabetically by call signals.*

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NAXL.....	Great Northern.....b	WYDA.....	St. Louis, Mo.....c
NITC.....	Tampa.....b	WYDB.....	Memphis, Tenn.....c
NITF.....	Haida.....b	WYDC.....	New Orleans, La.....c
NIXB.....	Modoc.....b	WYDD.....	Natchez.....b
NIVD.....	Modoc.....b	WYDE.....	Vicksburg.....b
NIZJ.....	Shawnee.....b	WYDF.....	Cairo.....b
WVM.....	Noorvik, Alaska.....c	WYDG.....	St. Louis.....b
WYCI.....	Jefferson Barracks, Mo.....c	WYDH.....	New Orleans.....b
WYCY.....	Fort Douglas, Utah.....c	WYDI.....	Baton Rouge.....b
WYCK.....	Fort D. A. Russel, Wyo.....c	WYDJ.....	Memphis.....b

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921.]

Station.	Call signal.	Station controlled by—
Baltimore, Md.	3XAA...	E. Craig Densten.
Baltimore, Md.	3XT....	R. Selway Collins.
Baltimore, Md.	3XX....	Louis E. Riehwen.
Detroit, Mich.	8XAB...	City of Detroit, Police Department.
Enterprise, Oreg.	7ZH....	Orland M. Heacock.
Houston, Tex.	5XS....	Tel Electric Co.
Kansas City, Mo.	9XK....	Robert R. Moore.
Montgomery, Ala.	5XR....	S. G. F. Rathborne.
Norfolk, Va.	3XY....	R. L. Hopkins and H. L. Buskey.

Special land stations grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
3XAA...	Third district:	7ZH....	Seventh district: Enterprise, Oreg.
3XT....	Baltimore, Md.	8XAB...	Eighth district: Detroit, Mich.
3XX....	Baltimore, Md.	9XK....	Ninth district: Kansas City, Mo.
3XY....	Norfolk, Va.		
5NR....	Fifth district:		
5XS....	Montgomery, Ala.		
	Houston, Tex.		

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

MARION, MASS.—System, Alexanderson alternator, w. l., 11620.

TUCKERTON, N. J.—W. l., 300, 600, 16120; service, PG; rates to France, 14 c. per word plus land-line charge.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ADMIRAL WATSON.—Range, 150; system, R. C. of A., 1000; w. l., 300, 450, 600.

AEOLUS.—System, Federal arc; w. l., 300, 450, 600, 1800.

AGAWAM.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.

AGWIBAY.—Guaranty Trust Co., owner of vessel.

ALABAMA (WRAE).—Range, 200; system, I. W. T. Co., 1000; w. l., 300, 600.

ALPENA.—System, R. C. of A., 480.

AMERICAN LEGION.—Range, 200; system, Federal arc; w. l., 300, 600, 1800.

ANNISTON.—System, R. C. of A., 1000; w. l., 300, 450, 600.

APACHE.—Range, 300; w. l., 300, 600.

ASHBEE.—System, Navy-Lowenstein, 1000; w. l., 300, 450, 600.

ASTRA.—Strike out all particulars.

BADDACOCK.—Strike out all particulars.

BARUGO.—Strike out all particulars.

BEATRICE.—System, I. W. T. Co., 1000.

BOLIKOW.—Strike out all particulars.

CARL D. BRADLEY.—System, R. C. of A., 1000.

CAROLINA.—Range, 150; system, R. C. of A., 240; hours, N.

- CHAPPELL.—Range, 200; system, Navy, 1000; w. l., 300, 600.
- CHARLES O. JENKINS.—Range, 150; system, R. C. of A., 1000; w. l., 300, 600.
- CHESTER VALLEY.—Range, 300; w. l., 300, 450, 600.
- CHICKASAW.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
- CHICKASAW CITY.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600; hours, X.
- CHICOMICO.—W. l., 300, 450, 600.
- CIGARETTE.—Name changed to Pocantico.
- CITY OF ALPENA II.—Strike out all particulars.
- CITY OF BANGOR.—Range, 150; system, R. C. of A., 1000.
- CITY OF BRUNSWICK.—Range, 200; system, International Radio Telegraph Co., 1000; w. l., 300, 450, 600.
- CITY OF CLEVELAND III.—System, R. C. of A., 1000.
- CITY OF DETROIT III.—System, R. C. of A., 1000.
- CITY OF ELWOOD.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
- CITY OF MACKINAC II.—Strike out all particulars.
- CITY OF SAVANNAH.—System, R. C. of A., 1000.
- CITY OF SHERMAN.—Range, 300; system, Federal arc; w. l., 300, 600.
- CITY OF ST. IGNACE.—Range, 150; system, R. C. of A., 1000; w. l., 300, 450, 600.
- CLEMENS A. REISS.—Range, 150; system, R. C. of A., 1000.
- COLUSA.—Range, 300; system, R. C. of A., 1000; hours, X.
- CONCHO.—W. l., 300, 600.
- CONNEAUT.—Range, 200; system, R. C. of A., 480; rates, Great Lakes service 2 c. per word.
- COTOPAXI.—System, R. C. of A., 1000.
- COULEE.—Range, 200; system, R. C. of A., 1000; w. l., 300, 450, 600.
- COWBOY.—System, Navy-Marconi, 1000; w. l., 300, 450, 600.
- DANEBOG.—Strike out all particulars.
- EASTERN STATES.—System, R. C. of A., 1000.
- ELKHORN.—W. l., 300, 450, 600.
- FARNAM.—Station operated and controlled by I. W. T. Co.
- F. B. SQUIRE.—Range, 150; system, R. C. of A., 1000; w. l., 300, 600.
- FLORENCE LUCKENBACH.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600.
- FRED'K. LUCKENBACH.—Range, 300; w. l., 300, 450, 600; rates, transoceanic service 4 c. per word.
- FREEPORT SULPHUR No. 1.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
- GEORGE WASHINGTON.—Range, 300-800; system, Navy-Marconi, 1000 and Federal arc; w. l., 300, 450, 600.
- GEORGIA (KUR).—Range, 300; w. l., 300, 600.
- HARVARD.—Range, 300; system, Navy, 1000; rates, North and South American service 8 c. per word; Los Angeles S. S. Co. owner of vessel.
- HARVEY H. BROWN.—Range, 150; system, R. C. of A., 1000; w. l., 300, 600.
- HARRY W. CROFT.—System, R. C. of A., 1000.
- HOLLYWOOD.—Strike out all particulars.
- JAMESTOWN.—Range, 300.
- J. A. MOFFETT, Jr.—Station operated and controlled by R. C. of A.
- J. FLETCHER FARRELL.—Range, 300; system, R. C. of A., 1000; w. l., 300, 600.
- J. L. REISS.—System, R. C. of A., 1000.
- JOHN P. REISS.—System, R. C. of A., 1000.
- JOSEPH R. PARROTT.—Range, 150; system, R. C. of A., 1000.
- JUNIATA (WCB).—System, R. C. of A., 1000.
- KERHONKSON.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
- LAKE AGOMAK.—System, Navy-Marconi, 1000; w. l., 300, 450, 600.
- LAKE CATHERINE.—System, Navy-Marconi, 1000; w. l., 300, 450, 600.

- LAKE ELMONT.—Range, 200; system, Navy, 1000; w. l., 300, 450, 600.
- LAKE FERNANDO.—Station operated and controlled by I. W. T. Co.
- LAKE GRAVELLA.—System, Navy-Marconi, 1000; w. l., 300, 450, 600.
- LAKE HARRIS.—Range, 200; w. l., 300, 450, 600.
- LAKELAND.—System, R. C. of A., 1000.
- LAKE LARGA.—System, Navy-Simon, 1000; w. l., 300, 450, 600.
- LAKE PEARL.—W. l., 300, 450, 600.
- LAKE St. CLAIR.—Range, 200; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
- LAKE STIRLING.—W. l., 300, 450, 600.
- LAKE STRABO.—System, Navy-Marconi, 1000; w. l., 300, 450, 600.
- M. A. BRADLEY.—System, R. C. of A., 1000.
- MAITLAND No. 1.—System, R. C. of A., 1000.
- MASCOTTE.—System, R. C. of A., 1000.
- MEMPHIS CITY.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600; hours, X; rates, North and South American and transoceanic services 8 c. per word.
- MINNESOTA (WEK).—U. S. Shipping Board owner of vessel.
- MONANA.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.
- MOPANG.—Strike out all particulars.
- MORRO CASTLE.—W. l., 300, 600.
- NAMASKET.—Station operated and controlled by S. O. R. S.
- NASHABA.—Range, 300; system, Federal arc, w. l., 300, 600, 1800; station operated and controlled by S. O. R. S.
- NORTH AMERICAN.—System, R. C. of A., 1000.
- OCTORARA.—Range, 150; system, R. C. of A., 1000; w. l., 300, 450, 600.
- ORINOCO.—System, Navy-Marconi, 1000; w. l., 300, 450, 600.
- OSWEGO.—Range, 300; system, R. C. of A., 1000.
- OTTO M. REISS.—Range, 150; system, R. C. of A., 1000; w. l., 300, 600.
- PASADENA.—W. l., 300, 600; hours, X.
- PETER REISS.—Range, 150; system, R. C. of A., 480.
- PORTO RICO.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 600.
- RICHARD J. REISS.—Range, 150; system, R. C. of A., 1000.
- ROBERT C. SUDDEN.—Name changed to John C. Kirkpatrick.
- SEATTLE SPIRIT.—Station operated and controlled by S. O. R. S.
- SILVER SHELL.—Range, 300; system, R. C. of A., 1000.
- SIR THOMAS SHAUGHNESSY.—System, R. C. of A., 240.
- SOLITAIRE.—Range, 150; system, I. W. T. Co., 1000; w. l., 300, 600; rates, North and South American service 4 c. per word.
- STATE OF OHIO.—Range, 150; system, R. C. of A., 1000.
- STEEL ENGINEER.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; hours, X.
- STEEL EXPORTER.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; hours, X.
- SUMMERLEAF.—Range, 300; system, Navy-Marconi 1000; w. l., 300, 450, 600.
- TORMENTER.—Range, 150; system, R. C. of A., 1000; w. l., 300, 450, 600.
- WEST CHATALA.—Range, 200; system, Navy, 1000; w. l., 300, 450, 600; hours, X.
- WESTERN FRONT.—Strike out all particulars.
- WESTERN LIGHT.—W. l., 300, 450, 600.
- WESTERN STATES.—Range, 150; system, R. C. of A. 1000; w. l., 300, 450, 600.
- WEST IRA.—Station operated and controlled by R. C. of A.
- WESTLAND (KDOY).—System, R. C. of A., 1000; w. l., 300, 600.
- WEST O'ROWA.—Station operated and controlled by S. O. R. S.
- WESTWEGO.—System, R. C. of A., 1000.
- W. F. WHITE.—Range, 150; system, R. C. of A., 1000; w. l., 300, 600.
- WILLIAM A. REISS.—Range, 150; system, R. C. of A., 1000.
- WILLIAM G. MATHER.—System, R. C. of A., 1000.
- WILLIMANTIC.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.

WINONA COUNTY.—Range, 300; system, Wireless Improvement Co., 1000; w. l., 300, 450, 600.

WM. BOYCE THOMPSON.—Range, 300; system, R. C. of A., 1000; w. l. 300, 600.

YANKEE ARROW.—Station operated and controlled by R. C. of A.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDQQ, read Pocantico; **KDQR**, read John C. Kirkpatrick; strike out all particulars following the call signals, **KDSE**, **KEQC**, **KEQD**, **KOPX**, **KUJD**, **WEB**, **WEH**, **WJQ**, **WKH**, and **WXAQ**.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921.]

SEA GATE, N. Y. (NAH).—Strike out all particulars.

APPLEDORE ISLAND, ME.—Strike out all particulars.

FORT HOWARD, MD.—Call letters changed to **WYCC**.

FORT LEAVENWORTH, KANS.—Strike out all particulars.

JACKSONVILLE, FLA.—Strike out all particulars.

PORT ROYAL, S. C.—Read Parris Island, S. C.

SLIP POINT, WASH. (NPD).—Strike out all particulars.

WASHINGTON, D. C. (WUP).—Strike out all particulars.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921.]

S. P. 1128 (Conestoga).—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

WZAC, read **WYCC**; **NAV**, read Parris Island, S. C.; strike out all particulars following the call signals **NAGP**, **NFI**, **NPD** (Slip Point, Wash.), **NTW**, **WUD**, and **WUP**.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

BURLINGAME, CALIF. (6ZR).—Read Los Angeles, Calif.

DALLAS, TEX. (5ZG).—Strike out all particulars.

HARTFORD, CONN. (1XV).—Strike out all particulars.

KANSAS CITY, MO. (9ZZ).—Strike out all particulars.

OAKLAND, CALIF. (6XX).—Strike out all particulars.

ROCKLAND, ME. (1XQ).—Strike out all particulars.

SAN ANTONIO, TEX. (5ZAI).—Call signal changed to **5ZAK**.

SAN FRANCISCO, CALIF. (6XC).—Pacific Radio Supplies Co. owner of station.

MISCELLANEOUS.

OPERATOR'S LICENSE SUSPENDED.

First-grade license No. 19331, issued at New Orleans, November 13, 1919, has been suspended for a period of three months for violation of article 6 of the International Convention service regulations, in that the holder of the license transmitted superfluous signals.

BARRED FROM EXAMINATION.

Recently an applicant for a radio operator's license was barred from taking another examination for a period of one year, as he attempted to procure his license in a fraudulent manner by copying information from a textbook during the time of his examination.

STATIONS IN CHINA.

The Chinese Government maintains coast stations at Woosung (XSG), Foochow (XOW), and Canton (XNP) for exchange of telegrams between ships at sea and any telegraph office in China, and no other station on the coast of China has the right to handle public correspondence emanating or terminating in China. This information was recently received from the Director General of Telegraphs, Peking, China.

PUBLICATIONS ON RADIO BY THE BUREAU OF STANDARDS.

The following articles regarding radio work of the Bureau of Standards have been published recently:

Measurements on Audio-Frequency Amplifiers. By L. M. Hull. *Wireless Age*, 8, page 12, June, 1921.

Radio Communication with Postal Airplanes. By L. E. Whittemore and J. L. Bernard. *Aerial Age Weekly*, 13, April 11, 18, and 25, 1921, pages 105, 127, and 155.

The Distributed Capacity of Inductance Coils. By G. Breit. *Physical Review*, 17, page 649, June, 1921.

The Department of Commerce Radio Fog Signaling System. By F. A. Kolster. *Shipping*, page 13, February 25, 1921.

Radio Signal Fading Phenomena. By J. H. Dellinger and L. E. Whittemore. *Journal of the Washington Academy of Sciences*, June 4, 1921.

RADIO FOG-SIGNAL STATIONS.

Radio fog signals were established on May 1 last at Ambrose Channel Light Vessel, Fire Island Light Vessel, and Sea Girt Light Station. A vessel equipped with radio compass may determine its bearing from the above signals. The signals are operated each day from 9 to 9.30 a. m. and from 3 to 3.30 p. m. and continuously during thick or foggy weather. Signals are transmitted on 1,000-meter wave-length, as follows:

Ambrose Channel Light Vessel transmits a series of single dashes for 20 seconds, silent 20 seconds.

Fire Island Light Vessel transmits a series of double dashes for 25 seconds, silent 25 seconds.

Sea Girt Light Station transmits a series of triple dashes for 60 seconds, silent 6 minutes.

INFORMATION FROM THE BERNE INTERNATIONAL BUREAU.

Great Britain.—The British Government advises that two general call signals, GEA and GEZ, have been assigned to stations rendering service for aerial navigation. GEA designates any airplane of the British Aerial Forces and GEZ designates any land station.

Iceland.—Normal time was reestablished on July 1 last.

Hungary.—The radio station of Csepel transmits, daily, between 10.20 and 10.30 p. m. (central European time), the bulletins of the Institute of Meteorology and Earth Magnetism at Budapest.

Italy.—Radiogoniometric bearings rendered by a fixed (shore) Italian station, on the request of a mobile station (ship), shall be accepted on the collection of a fixed coast charge of 6 francs for each bearing. Radiograms of this kind are to be handled at the point of liquidation of accounts in the same way as ordinary radiograms of ships.

LOST COMMERCIAL RADIO OPERATORS' LICENSES.

Printed below is a list of radio operators' licenses which have been reported to this Bureau as having been lost. Should any of them be found, they should be returned to the Bureau for cancellation. Inspectors and others concerned should see that lost licenses are not being used by unauthorized persons.

Name.	Grade.	Number.	Date issued.	Port issued.
Bauer, Joseph T.	First.	15707	June 12, 1918	Seattle.
Boothroyd, P. D.	do.	20167	Oct. 27, 1919	Do.
Brown, Louis.	do.	21012	Apr. 14, 1921	New York.
Butler, Ralph E.	do.	22457	Apr. 12, 1920	Seattle.
Chipman, Gordon P.	do.	20107	Sept. 22, 1919	Do.
Coman, Lucian D.	do.	16379	Nov. 28, 1919	Detroit.
Davis, Burton L.	do.	16446	Jan. 22, 1919	Boston.
Dowling, John F.	do.	19706	Nov. 21, 1919	Do.
Dunlap, William T.	do.	23680	Nov. 5, 1920	New York.
Eberlin, Viggo C.	do.	21021	Apr. 19, 1921	Do.
Gates, Francis S.	do.	21751	Feb. 10, 1920	San Francisco.
Gerber, John H.	do.	20769	Apr. 24, 1920	New York.
Gordon, Henry.	do.	18952	Aug. 18, 1919	Do.
Grout, Leslie H.	do.	19042	Sept. 4, 1919	Do.
Hansen, Lincoln.	Second.	16160	May 17, 1920	Do.
Helgeson, Harry G.	First.	19855	Feb. 13, 1920	Baltimore.
Hendrix, Paul A. T.	do.	24078	June 25, 1920	San Francisco.
Hunt, Howard E.	do.	18797	July 24, 1919	Boston.
Hyman, Harry.	do.	22125	July 17, 1920	Baltimore.
Keefe, Francis M.	do.	21451	Feb. 18, 1920	Boston.
Klosner, Morris.	do.	19219	Oct. 10, 1919	New York.
LeRoy, Frank S.	Second.	15831	Jan. 30, 1920	Do.
McDonald, John W.	First.	24126	Feb. 2, 1921	San Francisco.
McElroy, Charles A.	do.	21390	July 15, 1920	Boston.
Miller, William C.	do.	16931	May 23, 1919	Washington, D. C.
Nunan, Joseph.	Second.	17580	July 19, 1920	New York.
Otten, George C.	First.	18535	June 5, 1919	Do.
Red, W. K. H.	do.	20505	Nov. 24, 1919	Do.
Sabin, G. C.	do.	19733	Dec. 9, 1919	Boston.
Scheir, Leon.	do.	22169	Oct. 8, 1920	Philadelphia.
Verret, Chas. Noah.	do.	19042	Sept. 4, 1919	New York.

STATION CLOSED.

The radio station operated by the East Coast Fisheries Co. at Rockland, Me., call letters WST, will close on September 7 at midnight.

CHANGE IN RATES FOR NAVAL STATIONS.

Effective November 1 next the delivery rates for traffic destined to points in Panama via the naval stations in the Canal Zone will be as follows:

2 c. per word for the first 10 words, 1 c. for each word thereafter, in addition to the regular amount for the charge of receiving radio stations.

EXAMINATION FOR RADIO INSPECTOR.

The U. S. Civil Service Commission will hold an examination on October 5 next for radio inspector and assistant radio inspector to fill vacancies which may occur in the Bureau of Navigation, Department of Commerce. For further information apply to the Commission.

ADDITIONAL COPIES

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, October 1, 1921—No. 54

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name	=Name of station.
G. loc.	=Geographical location: O=west longitude, N=north latitude. S=south latitude.
Call	=Call letters assigned.
System	=Radio system used and sparks per second.
Range	=Normal range in nautical miles.
W. L.	=Wave lengths assigned: Normal wave lengths in italics.
Service	=Nature of service maintained:
	PG=General public.
	PR=Limited public.
	P =Private.
	O =Government business exclusively.
Hours	=Hours of operation:
	N =Continuous service.
	X =No regular hours.
	m =a. m. (12m=midday).
	s =p. m. (12s=midnight).
Rates	=Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co.	=Independent Wireless Telegraph Co.
R. C. of A.	=Radio Corporation of America.
S. O. R. S.	=Ship Owners Radio Service.
Co.	=Company.
Corp.	=Corporation.
&	=And.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Brooklyn, N. Y. ¹	WNY	300, 450, 600, 1,800.	PG	N	R. C. of A.
Flat Rock, Mich. ²	WFD	300, 385, 500, 600.	PR	X	Ford Motor Co.
Frankfort, Mich. ³	WFK	300, 450, 600.	PG	.....	Ann Arbor Railway Co.
Laramie, Wyo. ⁴	KDC	1,685.	PR	X	Illinois Pipe Line Co.
Ludington, Mich. ⁵	WLD	300, 450, 600.	PG	.....	Pere Marquette Railway Co.
Manitowoc, Wis. ⁶	WMW	300, 475, 600.	PG	.....	Do.
Martinsville, Ill. ⁷	WHY	1,685.	PR	X	Illinois Pipe Line Co.
Negley, Ohio. ⁸	WCQ	1,685.	PR	X	Do.
New Haven, Conn. ⁹	WCJ	300, 360, 600.	PR	X	A. C. Gilbert Co.
Roselle Park, N. J. ¹⁰	WDY	300, 360, 600.	PR	.....	R. C. of A.
Springfield, Mass. ¹¹	WBZ	360, variable.	PR	X	Westinghouse Electric & Manufacturing Co.
St. James, N. Y. ¹²	WQK	16,465.	PG	N	R. C. of A.

¹ Loc. O 74° 00' 05", N. 49° 39' 30"; range, 400; system, R. C. of A., 1000; rates, ship service 10 c. per word; vessels plying between ports not over 200 miles from New York City, 3 c. per word.

² Loc. (approximately) O 83° 13' 00", N. 42° 17' 00"; range, 100; system, composite; rates, none.

³ Loc. O 88° 14' 17", N. 44° 37' 46"; range, 150; system, Marconi, 120; hours, 5 a. m. to 12 midnight; rates, Great Lakes service, 3 c. per word.

⁴ Loc. O 105° 34' 51", N. 41° 18' 39"; range, 200; system, Deforest; rates, none.

⁵ Loc. O 86° 26' 19", N. 43° 56' 47"; range, 150; system, Marconi, 120; hours, 5 a. m. to 12 midnight; rates, Great Lakes service, 3 c. per word.

⁶ Loc. (approximately) O 87° 45' 00", N. 44° 07' 00"; range, 100; system, Marconi, 120; hours, 8 a. m. to 12 midnight; rates, Great Lakes service, 3 c. per word.

⁷ Loc. O 87° 54' 08", N. 39° 20' 30"; range, 200; system, Deforest; rates, none.

⁸ Loc. O 80° 34' 54", N. 40° 47' 48"; range, 200; system, Deforest; rates, none.

⁹ Range, 300; system, A. C. Gilbert Co.; rates, none.

¹⁰ Loc. O 74° 20' 07", N. 40° 43' 05"; range, 100; system, General Electric Co.; hours, 7 p. m. to 12 p. m.; rates, none.

¹¹ Loc. O 72° 33' 08", N. 42° 08' 30"; range, 500; system, Westinghouse, arc; rates, none.

¹² Loc. O 72° 56' 30", N. 40° 55' 45"; range, 4,000; system, R. C. of A., Alexanderson alternator; rates, to Germany, 25 c. per word.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
Adam E. Cornelius...	KDVF	Cents.	Cents.	PG	X	American S. S. Co....	S. O. R. S.
Agwimex.....	KDUQ	.....	.....	PG	X	Atlantic, Gulf & West Indies S. S. Lines.	
Celestial.....	KDUV	4	4	PG	X	U. S. S. B.....	
Chattanooga City.....	KDUW			PG	X	U. S. Steel Products Co.	Owner of vessel.
Faith.....	KDVG	.....	.....	.....	X	Irving E. Raymond...	
Gertrude ¹	KDVC	4	.....	PR	.....	Sabine Towing Co....	
G. N. Wilson.....	KDUX			PG	X	American S. S. Co....	S. O. R. S.
Hoosier State.....	KDUY	4	4	PG	N	U. S. S. B.....	
Levant Arrow.....	KDVB	.....	.....	PG	X	Standard Transportation Co.	
M. A. Reeb.....	KDUZ			PG	X	American S. S. Co....	R. C. of A.
Pine Tree State.....	KDUT	4	4	PG	N	U. S. S. B.....	
Robert E. Hopkins...	KDVE	.....	.....	PG	X	Tidewater Oil Co....	
Sapphire.....	KDUS	.....	.....	.....	.....	J. D. Adams.....	
Tamiahua.....	KDVA	.....	.....	PG	X	Southern Pacific Co.	
T. J. Williams.....	KDUR	8	8	PG	X	Standard Oil Co. of N. J.	
West Chopaka.....	KDVH	4	4	PG	X	U. S. S. B.....	

¹ Range 150; system, Société Française Electrique, 1000; w. l., 300, 600; hours, 7 a. m. to 7 p. m.

Commercial land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDC	Laramie, Wyo.....c	KDVF	Adam E. Cornelius.....b
KDUQ	Agwimex.....b	KDVG	Faith.....b
KDUR	T. J. Williams.....b	KDVH	West Chopaka.....b
KDUS	Sapphire.....b	WBZ	Springfield, Mass.....c
KDUT	Pine Tree State.....b	WCJ	New Haven, Conn.....c
KDUV	Celestial.....b	WCQ	Negley, Ohio.....c
KDUW	Chattanooga City.....b	WDY	Roselle Park, N. J.....c
KDUX	G. N. Wilson.....b	WFD	Flat Rock, Mich.....c
KDUY	Hoosier State.....b	WFK	Frankfort, Mich.....c
KDUZ	M. A. Reeb.....b	WHY	Martinsville, Ill.....c
KDVA	Tamiahua.....b	WLD	Ludington, Mich.....c
KDVC	Gertrude.....b	WMW	Manitowoc, Wis.....c
KDVD	Levant Arrow.....b	WNY	Brooklyn, N. Y.....c
KDVE	Robert E. Hopkins.....b	WQK	St. James, N. Y.....c

Government land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Bryan, Ohio.....	KDEL	Post Office Department.
Fort Crook, Nebr.....	WYCG	War Department.
Marfa, Tex.....	WUG	Do.
San Francisco, Calif. (Presidio of San Francisco).....	WYCH	Do.

Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Nantucket.....	NFU	U. S. Navy.
Polillo.....	KDVB	Philippine Insular Government.

Government land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
KDEL	Bryan, Ohio.....c	WYCG	Fort Crook, Nebr.....c
KDVB	Polillo.....b	WYCH	San Francisco, Calif. (Presidio of San Francisco).....c
NFU	Nantucket.....b		
WUG	Marfa, Tex.....c		

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921.]

Station.	Call signal.	Station controlled by—
Baltimore, Md.	3ZN	Harold A. Hogan.
Charlottesville, Va.	3XAB	Virginia Radio Co.
Craddock, Va.	3ZZ	Aloysius A. Kubiak.
Commerce, Tex.	5ZAM	Arthur C. West.
Decatur, Ga.	4ZF	Thurston Hatcher.
Fayetteville, Ark.	5YM	University of Arkansas.
Austin, Tex.	5XU	University of Texas.
Los Angeles, Calif.	6XAK	Leo J. Meyberg Co.
Oakland, Calif.	6XAL	Alfred H. Cohen.
Do.	6XAM	Stafford W. Warner.
Oklahoma City, Okla.	5XT	Oklahoma Radio Shop.
Springfield, Mass.	1XAE	Westinghouse Electric & Manufacturing Co.
Washington, D. C.	3YN	National Radio Institute.
Yankton, S. Dak.	9YAK	Yankton College.

Special land stations, grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
1XAE	First district: Springfield, Mass.	5XT	Fifth district:
3XAB	Third district:	5XU	Oklahoma City, Okla.
3YN	Charlottesville, Va.	5YN	Austin, Tex.
3ZN	Washington, D. C.	5ZAM	Fayetteville, Ark.
3ZZ	Baltimore, Md.		Commerce, Tex.
4ZF	Craddock, Va.		Sixth district:
	Fourth district: Decatur, Ga.	6XAK	Los Angeles, Calif.
		6XAL	Oakland, Calif.
		6XAM	Do.
		9YAK	Ninth district: Yankton, S. Dak.

ALTERATIONS AND CORRECTIONS.**COMMERCIAL LAND STATIONS.**

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

AMUGUIS, P. I.—Loc. (approximately) E. 122° 40' 00'', N. 13° 15' 00''; range, 300; system, Marconi, w. l., 600, 1200; service, PG; hours, 8 a. m. to 5.30 p. m.; rates, 12 c. per word.

BATANGAS, P. I.—Loc. (approximately) E. 121° 00' 00'', N. 13° 47' 00''; range, 1000; system, Marconi, w. l., 2700; service, PG; hours, 7 a. m. to 8 p. m.; rates, 12 c. per word.

BOLINAS, CALIF. (KET).—Range, 4000; w. l., 13345.

BROOKLYN, N. Y. (WGO).—Strike out all particulars.

CAPE MAY, N. J.—System, R. C. of A., 240-1000; w. l., 300, 525, 600; station operated and controlled by R. C. of A.

CEBU, P. I.—Loc. (approximately) E. 123° 50' 00'', N. 10° 18' 00''; range, 500; service, PG; w. l., 600, 1200; hours, 7 a. m. to 8 p. m.; rates, 12 c. per word.

CHICAGO, ILL. (WGO).—W. l., 2400, 2800; hours, 7 a. m. to 6 p. m.

CHICHAGOF, ALASKA.—Loc. O 136° 05' 40'', N. 57° 39' 35''; range, 50; system, composite, 120; w. l., 300, 550, 600; service, PR; hours, X; rates, ship service, 6 c. per word, no minimum, cable count; station to station, 6 c. per word, domestic count; station to station night message, 5 c. per word, domestic count; station to station night letter, 60 c. for 50 words, 12 c. for each additional 10 words or fraction thereof.

CLEVELAND, OHIO.—Hours, 8.30 a. m. to 6 p. m.

- CULION, P. I.—Loc. (approximately) E. $120^{\circ} 02' 00''$, N. $11^{\circ} 50' 00''$; range, 200 system, Marconi, w. l., 600, 1200; service, PG; hours, 8 a. m. to 5.30 p. m.; rates, 12 c. per word.
- CUYO, P. I.—Hours, 8 a. m. to 5.30 p. m.; rates, 12 c. per word.
- DAVAO, P. I.—Hours, 8 a. m. to 5.30 p. m.; rates, 12 c. per word.
- FALL RIVER VALLEY, CALIF.—Strike out all particulars.
- ILOILO, P. I.—Loc. (approximately) E. $122^{\circ} 30' 00''$, N. $10^{\circ} 40' 00''$; range, 500; system, Marconi, w. l., 600-1200; service, PG; hours, 7 a. m. to 8 p. m.; rates, 12 c. per word.
- ISABELA DE BASILAN, P. I.—Hours, 8.30 a. m. to 5.30 p. m.; rates, 12 c. per word.
- JOLO, P. I.—Hours, 8 a. m. to 5.30 p. m.; rates, 12 c. per word.
- MALABANG, P. I.—Hours, 7 a. m. to 8 p. m.
- MALANGAS, P. I.—Loc. (approximately) E. $123^{\circ} 00' 00''$; N. $7^{\circ} 42' 00''$; range, 300; system, Kilbourne & Clark; w. l., 300, 600; service, PG; hours, 8 a. m. to 5.30 p. m.; rates, 12 c. per word.
- MALITA, P. I.—Loc. (approximately) E. $125^{\circ} 36' 00''$, N. $6^{\circ} 22' 00''$; range, 200; system, Marconi, w. l., 600, 1200; service, PG; hours, 8 a. m. to 5.30 p. m.; rates, 12 c. per word.
- NEW BRUNSWICK, N. J. (WNY).—Strike out all particulars.
- NEWPORT, R. I.—System, R. C. of A., 1000; hours, 8 p. m. to 4 a. m.
- NEW YORK, N. Y. (WLB).—W. l., 2780, 3600.
- ROCKLAND, ME.—Strike out all particulars.
- SAN FRANCISCO, CALIF. (KDQO).—Strike out all particulars.
- SAN FRANCISCO, P. I. (CAMOTES).—Loc. (approximately) E. $124^{\circ} 22' 00''$, N. $10^{\circ} 38' 00''$; range, 150; system, Marconi, w. l., 300, 600; service, PG; hours, 8 a. m. to 5.30 p. m.; rates, 12 c. per word.
- SAN JOSE, P. I.—Hours, 8 a. m. to 5.30 p. m.; rates, 12 c. per word.
- SIASCONSET, MASS.—Strike out all particulars.
- ZAMBOANGA, P. I.—W. l., 600, 1800; hours, 7 a. m. to 8 p. m.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

- AGWIWORLD.—Range, 200; system, I. W. T. Co., 1000; w. l., 300, 600.
- ALA.—Range, 200; system, Navy, 1000; w. l., 300, 450, 600; station operated and controlled by R. C. of A.
- ALCONA.—System, Navy, 1000; w. l., 300, 450, 600.
- ALGIC.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
- ALOHA.—Range, 150; system, R. C. of A., 1000; rates, North and South American and transoceanic services, 8 c. per word.
- ANDREA F. LUCKENBACH.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services 4 c. per word.
- ARIZONA.—System, R. C. of A., 240.
- BALSAM.—Range, 300; system, Navy-Marconi, 1000; hours, X.
- BANNACK.—System, Navy-Liberty, 1000; w. l., 300, 450, 600; hours, X.
- BELAIR.—Strike out all particulars.
- BIRAN.—Station operated and controlled by R. C. of A.
- BLAIR.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.
- BOSTON (KXA).—Station operated and controlled by R. C. of A.
- CAMBRIDGE (KGR).—Station operated and controlled by R. C. of A.
- CAYO MAMBI.—Range, 200; system, I. W. T. Co., 1000; rates, North and South American and transoceanic services 4 c. per word.
- CERRO EBANO.—Station operated and controlled by R. C. of A.

- CHESTER W. CHAPIN.—System, R. C. of A., 260; station operated and controlled by R. C. of A.
- CHETOPA.—System, Navy, 1000; w. l., 300, 450, 600.
- CITY OF ALTON.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.
- CITY OF BENTON HARBOR.—Strike out all particulars.
- CITY OF BROCKTON.—Station operated and controlled by R. C. of A.
- CITY OF BRUNSWICK.—Strike out all particulars.
- CITY OF BUFFALO.—System, R. C. of A., 1000.
- CITY OF DETROIT II.—System, R. C. of A., 1000; w. l., 300, 450, 600.
- CITY OF ERIE.—Range, 150; system, R. C. of A., 1000.
- CITY OF GRAND RAPIDS.—Strike out all particulars.
- CITY OF LOWELL.—System, R. C. of A., 260; station operated and controlled by R. C. of A.
- CITY OF TAUNTON.—Station operated and controlled by R. C. of A.
- COMAL.—Range, 300; w. l., 300, 600.
- COMMONWEALTH.—Station operated and controlled by R. C. of A.
- CONCORD.—System, R. C. of A., 260; station operated and controlled by R. C. of A.
- CRICKET.—Fred Linderman, owner of vessel.
- CROFTON HALL.—Range, 150; system, R. C. of A., 1000.
- CUBURRA.—Anglo-California Trust Co., owner of vessel.
- DAVID MCKELVY.—Station operated and controlled by R. C. of A.
- DEMOCRACY.—Station operated and controlled by R. C. of A.
- EASTERN SEA.—Hours, X.
- EASTERN VICTOR.—W. l., 300, 450, 600; hours, X.
- EDWARD J. LAWRENCE.—Strike out all particulars.
- EMPIRE ARROW.—Station operated and controlled by R. C. of A.
- ESPARTA.—System, composite, 1000.
- FEDERAL.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; hours, X.
- FLORIDA (KUS).—Range, 150; system, R. C. of A., 1000.
- GALESBURG.—Station operated and controlled by R. C. of A.
- GEORGE PIERCE.—Range, 300; system, Federal, 1000 with chopper; w. l., 300, 600, 1800.
- GUINEVERE.—Range, 300; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, 600; service, PR; station operated and controlled by owner of vessel.
- GULFMAID.—Station operated and controlled by R. C. of A.
- GULF OF MEXICO.—Station operated and controlled by R. C. of A.
- GULFPORT.—System, R. C. of A., 240.
- GULF PRINCE.—Range, 200; system, I. W. T. Co., 1000; w. l., 300, 600.
- GULF QUEEN.—Range, 300; system, Navy, 1000.
- HANCOCK COUNTY.—W. l., 300, 450, 600.
- HARTFORD.—Station operated and controlled by R. C. of A.
- HATTERAS.—Station operated and controlled by R. C. of A.
- HAWARDEN.—Station operated and controlled by I. W. T. Co.
- HEGIRA.—System, Navy-Lowenstein, 1000; hours, X.
- H. F. DIMOCK.—Range, 150; system, R. C. of A., 1000.
- ICE KING.—Station operated and controlled by R. C. of A.
- I. D. FLETCHER.—Strike out all particulars.
- ILLINOIS (KDSZ).—Range, 300; system, I. W. T. Co. (arc); w. l., 300, 600, 1800; rates, North and South American services 4 c. per word; station operated and controlled by I. W. T. Co.
- ILLINOIS (WCZ).—Chicago, Racine & Milwaukee Line owner of vessel.
- INDIANA.—Range, 150; system, R. C. of A., 1000.
- IROQUOIS (KUTQ).—System, R. C. of A., 1000.

- JANELAW.—Range, 200; system, Federal arc; w. l., 300, 600, 1800.
- JOHN D. ARCHBOLD.—Station operated and controlled by R. C. of A.
- JOMAR.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.
- KNOXVILLE CITY.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services 8 c. per word; station operated and controlled by R. C. of A.
- LAKE ELMIR.—Range, 300; system, Wireless Improvement Co., 1000; w. l., 300, 450, 600.
- LAKE FLATONIA.—Station operated and controlled by I. W. T. Co.
- LAKE FLYNUS.—System, Navy-Marconi, 1000.
- LAKE FREELAND.—Range, 200; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
- LAKE GITANO.—Hours, N.
- LAKE GLEBE.—Range, 200; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
- LAKE INDIAN.—System, Simon, 1000.
- LEXINGTON.—System, R. C. of A., 260; station operated and controlled by R. C. of A.
- MANUKAI.—Range, 300; hours, N.
- MARNE (KEDJ).—Station operated and controlled by R. C. of A.
- MISSOURI.—Range, 150; system, R. C. of A., 1000.
- MOHAWK (KVM).—Range, 300.
- MOHAWK (KXE).—Station operated and controlled by R. C. of A.
- MOHEGAN.—System, R. C. of A., 260; station operated and controlled by R. C. of A.
- MONTAUK.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600; hours, X; rates, North and South American and transoceanic services 4 c. per word.
- NARCISSUS.—Range, 300; system, Federal arc; w. l., 300, 600, 1800.
- NEW HAMPSHIRE.—System, R. C. of A., 260; station operated and controlled by R. C. of A.
- NEW HAVEN.—System, R. C. of A., 260; station operated and controlled by R. C. of A.
- NEW YORK (KSN).—W. l., 300, 450, 600.
- NORTH AMERICAN.—Station operated and controlled by R. C. of A.
- OLDHAM.—Station operated and controlled by R. C. of A.
- ORINOCO.—Station operated and controlled by R. C. of A.
- O. T. WARING.—System, R. C. of A., 1000.
- PANOLA.—W. l., 300, 450, 600.
- PEQUONNOCK.—Station operated and controlled by R. C. of A.
- PEQUOT.—Station operated and controlled by S. O. R. S.
- PLAYA.—Station operated and controlled by R. C. of A.
- PLYMOUTH (KXH).—Station operated and controlled by R. C. of A.
- PRINCESS MATOIKA.—Station operated and controlled by I. W. T. Co.
- PRISCILLA.—System, R. C. of A., 1000; station operated and controlled by R. C. of A.
- PROVIDENCE.—Station operated and controlled by R. C. of A.
- PUEBLO.—Station operated and controlled by R. C. of A.
- PURITAN.—System, R. C. of A., 1000.
- PYLOS.—System, Lowenstein, 1000.
- RELIEF.—System, Telefunken, 1000; w. l., 300, 600.
- RESOLUTE.—Range, 150; system, Navy-Simon, 1000; w. l., 300, 450, 600.
- RICHARD PECK.—Station operated and controlled by R. C. of A.
- RIPPLE.—Range, 150; system, Marconi, 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services, 4 c. per word; station operated and controlled by S. O. R. S.
- ROBERT P. CLARK.—W. l., 300, 600.
- RUTH.—System, I. W. T. Co., 1000; w. l., 300, 450, 600.
- SAC CITY.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.

SALMON.—Strike out all particulars.

SAMUEL MITCHELL.—System, R. C. of A., 1000.

SAN MATEO.—Range, 200; system, Wireless Specialty Apparatus Co., 1000.

SANTA INEZ.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.

SAUGUS.—W. l., 300, 450, 600.

SCHNECTADY.—System, Navy, 1000; w. l., 300, 450, 600.

SOUTH AMERICAN.—Range, 150; system, R. C. of A., 1000; station operated and controlled by R. C. of A.

THE LIMIT.—Strike out all particulars.

TIONESTA.—System, R. C. of A., 1000; w. l., 300, 450, 600.

TRONTOLITE.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 600.

TUNICA.—Station operated and controlled by R. C. of A.

TURRIALBA.—Range, 300; system, Wireless Specialty Apparatus Co., 1000.

WACHUSETT.—Station operated and controlled by R. C. of A.

WAFAMA.—Range, 200; system, Gray & Danielson, 240.

WEST GREYLOCK.—Station operated and controlled by S. O. R. S.

WEST HAVEN.—Range, 300; w. l., 300, 600; hours, N.

WEST ISLAY.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.

WEST KEENE.—System, Navy, 1000; w. l., 300, 450, 600.

WESTMEAD.—Station operated and controlled by R. C. of A.

WEST QUECHE.—System, Navy-Lowenstein, 1000; w. l., 300, 450, 600.

WEST VACA.—Station operated and controlled by I. W. T. Co.

WESTWARD HO.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.

WILLAMETTE.—Range, 200; system, Gray & Danielson, 240.

WOODMANSIE.—System, Navy-Liberty, 1000; w. l., 300, 450, 600.

YUKON.—Station operated and controlled by R. C. of A.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals WCG, WCV, WDS, WDV, WNY (New Brunswick), WSC, WST, WTOI, KDNQ, KDQN, KDQO, KFI, KPOU, and KQY.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921.]

BOSTON, MASS.—Call signal changed to WYCA.

FORT BENJAMIN HARRISON, IND.—Call signal changed to WYCE.

FORT HOWARD, MD. (WZB).—Strike out all particulars.

FORT MASON, CALIF.—Strike out all particulars.

FORT MCINTOSH, TEX.—Read Laredo, Tex.

FORT MCPHERSON, GA.—Call signal changed to WYCD.

FORT MILLS, P. I.—Strike out all particulars.

FORT MONROE, VA. (WUG).—Strike out all particulars.

FORT OMAHA, NEBR.—Strike out all particulars.

FORT SHERIDAN, ILL.—Call signal changed to WYCF.

FORT STORY, VA.—Read Fort Storey, Va.

FORT ST. PHILIP, LA.—Strike out all particulars.

FORT WOOD, N. Y.—Call signal changed to WYCB.

SEATTLE, WASH.—Strike out all particulars.

ST. LOUIS, MO.—Strike out all particulars.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921.]

GREAT NORTHERN (WIR).—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

WUH, read Laredo, Tex.; **WXZ**, read Fort Storey, Va.; **WZAA**, read WYCA; **WZAB**, read WYCB; **WZAD**, read WYCD; **WZAE**, read WYCE; **WZAF**, read WYCF; strike out all particulars following the call signals **KDEL** (St. Louis, Mo.), **KPA**, **WIR**, **WUG**, **WVZ**, **WXQ**, **WZAG**, **WZAH**, and **WZB**.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

NEW YORK, N. Y. (2XAG).—Strike out all particulars.

PARKERSBURG, VA. (3XW).—Read Parkesburg, Pa.

PARKERSBURG, PA. (3ZO).—Read Parkesburg, Pa.

PITTSBURGH, PA. (8XH).—Strike out all particulars.

MISCELLANEOUS.

CHRONOMETERS CORRECTED BY RADIO.

The British steamer *Port Kembla* reports that on June 26, 1921, time signals were received from Manila, P. I., bearing N. 34° W. (true) 3,630 miles, and 12 hours later time signals were received from Melbourne, Australia, bearing west about 740 miles. The comparison of these two time signals from Manila and Melbourne gave very satisfactory chronometer corrections.—*From Hydrographic Bulletin, Aug. 31, 1921.*

RADIO RESTRICTIONS AT RUSSIAN SOVIET PORTS.

The commander of the United States naval attachment in Turkish waters reports the following, which was issued by radio from Moscow, under date of August 11, 1921: "To all Governments: The Russian Government calls to the attention of captains of ships making passage to Russian ports that it is temporarily forbidden by the local authorities of the following ports, Petrograd, Kronstadt, Mourmansk, Archangelsk, Odessa, Novorossisk, Touapsee, Nikolaev, Teodosia, Sebastopol, to make use of the radio stations on board when the ships are in ports above mentioned."—*From Hydrographic Bulletin, Sept. 14, 1921.*

ERROR IN BEARINGS OBTAINED BY RADIO.

The director, United States naval communications, states that considerable difficulty is being experienced with merchant ships asking for radio bearings on very broad tunes, and that "bearings obtained by radio should be accurate within 2 degrees, provided that the transmitting equipment on board vessels is tuned sharply to 800 meters. Radio operators are cautioned to use sufficiently wide coupling to obtain low decrement. If radio transmitters are not tuned sharply, it is difficult to obtain bearings that are sufficiently accurate for navigational purposes."

Masters of vessels are advised to use the radio compass stations frequently, particularly in clear weather and when the vessel's position is definitely fixed, in order that the degree of accuracy and dependability of the radio compass may be established.—*From Hydrographic Bulletin, Sept. 28, 1921.*

A SIMPLE TYPE OF RADIO DIRECTION FINDER FOR USE ON SHIPBOARD—ITS APPLICATION, CONSTRUCTION, AND OPERATION.¹

APPLICATION IN MARINE DISASTERS.

At about 9.15 on the night of August 6 the steamship *Alaska*, from Portland to San Francisco, carrying 136 passengers and a crew of 84, struck Blunts Reef, off Cape Mendocino in northern California, in a heavy fog and sank in about 30 minutes. Throughout this time the *Alaska* sent out distress signals and the steamship *Anyox* reached the scene of the wreck from a distance of about 10 miles at about 11.15 p. m., and with the assistance of other boats which came later rescued many persons. Forty-two lives were lost. The *Anyox* had a barge in tow, which made it extremely difficult for her to stop or start or maneuver around in the fog. The steamship *Wahkeena* was only about 14 miles from the *Alaska* at the time that the first distress signal was transmitted and responded promptly, but did not reach the scene of the disaster until 7.30 a. m. the next morning. For two hours prior to the grounding of the *Alaska* its radio operator had been trying to obtain radio bearings by transmitting to the radio compass station on shore, at Eureka, Calif., but had been unable to get in communication with that station. The failure to obtain radio bearings was due in part to the fact that a large number of ships were endeavoring to obtain radio bearings at the same time. The *Wahkeena* did not rescue any persons. Neither the *Alaska*, the *Anyox*, nor the *Wahkeena* was equipped with a radio compass.

If the steamship *Alaska* had been provided with a radio compass and radio beacon transmitting stations had been established on shore, the radio operator on the *Alaska* could have determined her position at frequent intervals, and the wreck would probably never have occurred. If the *Anyox* had been provided with a simple radio compass, it could probably have reached the *Alaska* before it sank, instead of requiring two hours. If the *Wahkeena* had been equipped with a very simple type of radio compass, her radio operator could have very promptly determined the direction of the *Alaska*, so that the *Wahkeena* could have reached the *Alaska* in about an hour. The installation of radio compass equipment could thus have in all probability saved many lives and valuable property. The provision of radio compass equipment on board ship is obviously of particular importance in cases in which there are uncharted currents, since in such cases the setting of a course by dead reckoning in a fog may be disastrous. There is here given a description of a very simple type of radio compass coil which can be made by any one and if carried on board ship may prove to be of great value in emergencies.

The following extract from a letter from the senior radio operator on the *Alaska* will serve to emphasize the statements made above:

J. F. DILLON,

Radio Inspector, San Francisco, Calif.

Strongest in my mind remains the picture of the *Wahkeena*, 12 or 15 miles from us at 9.15 p. m., and after that trying unsuccessfully all night to locate us, while many unfortunate human lives were clinging to floating wreckage and succumbing slowly to exposure. I believe many lives could have been saved if seagoing vessels were equipped with even a simple device for finding the location of other vessels by radio signals. It has been proved that such apparatus can be installed with small cost. It would be still better to have ships equipped with audions or amplifiers.

(Signed) JOHN J. MICHELSON,
Operator, S. S. Alaska

The use of the radio compass to direct assistance to a wrecked ship is probably its most valuable field of usefulness. It has, however, many other applications, some of which are as follows:

1. A neighboring ship may be located in fog, and thereby passed in safety.

¹ By F. W. Dunmore, associate physicist, of the Bureau of Standards.

2. By means of the radio beacon installations now being made on lightships and at lighthouses a ship equipped with a radio direction finder may be guided safely along the coast or into harbor, during fog.

3. Lifeboats, adrift in the fog and full of survivors from a wreck, if equipped with even the most simple type of low-powered, hand-operated transmitting apparatus, could be located and picked up with little delay by the rescuing ship equipped with the radio direction finder. No knowledge of the code is necessary. The importance of the use of the direction finder for this purpose will be apparent when it is realized that many instances have occurred where a lifeboat adrift in the fog in the open ocean was not located until it was too late to save those aboard, and cases are on record where boats full of survivors were never found.

4. Harbor pilots during fog may locate ships waiting to be piloted into port.

5. Small boats and launches when detached from the mother ship on fishing trip, etc., if equipped with the radio compass, may locate the mother ship and return to her during fog.

CONSTRUCTION.

A simple form of direction finder may be made on shipboard and experimented with by any operator. Having once determined its range and application, it will be found of inestimable value, especially in such cases as the one of the S. S. *Alaska* cited above.

A type most easily constructed consists of two light pieces of wood, 7 feet long, crossed at an angle of 90 degrees, with 6-inch wooden spreaders on the four ends. This frame is wound with eight turns (spaced one-half inch) of No. 20 insulated copper wire, thus forming a square of approximately 5 feet on each side. The two terminals of the coil are connected directly to a tuning condenser and also to the grid and filament of the detector tube. With a tuning condenser of 0.0007 microfarad capacity it should be possible to tune to wave lengths from 400 to 800 meters. With a 0.0015 microfarad condenser the radio beacon wave length of 1,800 meters may be tuned to, and during fog if the ship is near Fire Island or Ambrose Channel Lightships or Sea Girt Lighthouse these beacons should be heard in operation on this wave length. Twelve turns in place of eight with the 0.0007 microfarads condenser will enable one to tune to 1,000 meters also.

When the coil is turned in the direction for maximum signal, distances of a few miles may be covered when using a crystal detector, but to operate satisfactorily a sensitive electron-tube detector should be used, or even better an electron-tube detector and one or two stages of audio amplification. With the two-stage amplifier a range of 25 miles or so should be obtained. A type of radio direction finder recently installed on the lighthouse tender *Tulip* by the Bureau of Standards and the Bureau of Lighthouses makes use of a six-step amplifier containing three radio stages, a detector, and two audio stages. In this radio compass the bearings are read directly on the card of the magnetic compass. This radio compass has a range of 50 miles when using the minimum method described below and has an accuracy of two or three degrees.

OPERATION.

To take a bearing, a station should first be tuned in. If no signal is heard, turn the coil 90 degrees. The operator should grasp the coil in both hands, holding it vertically in front of him. This will be found the easiest and most natural position in which to operate the coil.

As the coil is rotated about a vertical axis it will be found that the signal dies out over a certain sector of the revolution, then increases in strength to a maximum, decreases, and dies out again. This cycle is repeated twice as the coil is rotated through 360 degrees. Signals from a given transmitting station will be heard most strongly when the coil is turned in the direction of that station, and the signal dies

out when the plane of the coil is at right angles to the direction of the transmitting station. With a fairly strong signal the direction of a transmitting station can thus be determined by setting on either the position of the coil for maximum signal or the position for minimum signal. In general, for a strong signal the minimum method can be expected to give more accurate directions. With a weak signal, or with receiving apparatus of comparatively small sensitivity, it is preferable to set on the maximum signal. Thus, when a ship at a distance of 30 miles wishes to direct its course to another ship, it may be advantageous to determine the course by using the maximum signal until within perhaps 15 miles of the ship, and then with a stronger signal to use the minimum method to determine the direction of the ship more accurately.

In using the minimum method, as the coil is rotated through the silent zone, the two extreme positions where the signal becomes just audible should be noted. The coil is then turned to the position in the silent zone halfway between these points. The direction to the transmitting station is then approximately on a line lying at right angles to the plane of the coil; that is, either in front or to the rear of the operator, provided the operator turns with the coil. With care and practice directions may thus be determined to within 5 or 10 degrees, which should be sufficiently accurate to set a course to another ship. In cases where another ship is to be located and reached the accuracy of the bearings increases rapidly as the ship is approached, so that it is a simple matter to proceed directly to it.

The maximum method should be used in cases in which the sector over which the signal is inaudible is greater than the sector over which it is heard; that is, the latter sector should be used. Set the coil in the position where the signal is strongest. The transmitting station is then either directly to the operator's right or to his left; that is, in a line along the plane of the coil.

When taking a bearing, it is important that the ship's antenna be grounded and that the compass coil be as free as possible from metallic guys, wires, etc. For more accurate work it is important also to have all apparatus as near the coil as possible, with the filament battery at least a foot from the deck. Where the walls of the radio room are metallic, the coil should be located outside. Lead wires may be run in to the radio set, or, preferably, weather permitting, the tuning condenser, detector, etc., could be located outside near the coil.

The distortion of the radio wave due to the ship's mass may introduce an error of from 10 to 20 degrees. This error will generally be a maximum when the transmitting station lies on a line at 45 degrees to the ship's center line. With the signal coming from fore, aft, starboard, or port, the wave distortion is practically zero. When more accurate bearings are required, therefore, the ship should be turned so that the wave will approach the ship from any one of these directions. In cases where the radio compass is a permanent installation, such as the one on the lighthouse tender *Tulip*, a scale and pointer are provided and the bearings read in degrees. In this type of installation the radio compass is calibrated, so that corrections may be made for the effect of the ship in distorting the wave.

Information regarding the operation of the radio compass is contained in a publication of the Bureau of Standards now in press, "The Radio Direction Finder and Its Application to Navigation." Persons desiring more detailed information on specific points concerning the construction and operation of the radio compass may address an inquiry to the radio laboratory, Bureau of Standards, Washington, D. C.

INCREASE IN RATES FOR BOLINAS STATION.

Effective November 1, next, the marine station of the Radio Corporation of America at Bolinas (KPH) will charge 10 cents per word in lieu of the present rate of 6 cents per word.

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, January 3, 1922—No. 57

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name	=Name of station.
G. loc.	=Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call	=Call letters assigned.
System	=Radio system used and sparks per second.
Range	=Normal range in nautical miles.
W. L.	=Wave lengths assigned: Normal wave lengths in italics.
Service	=Nature of service maintained:
	PG=General public.
	PR=Limited public.
	P =Private.
	O =Government business exclusively.
Hours	=Hours of operation.
	N =Continuous service.
	X =No regular hours.
	m =a. m. (12 m=midday).
	s =p. m. (12s=midnight).
Rates	=Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co.	=Independent Wireless Telegraph Co.
R. C. of A.	=Radio Corporation of America.
S. O. R. S.	=Ship Owners' Radio Service.
Co.	=Company.
Corp.	=Corporation.
&	=And.
Do.	=Ditto.

CERTIFICATE.

By direction of the Secretary of Commerce this publication is issued as an administrative report and is required for the proper transaction of the public business.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Cincinnati, Ohio. ¹	WMH	360, 485.....	PR	X	Precision Equipment Co.
Everett, Wash. ²	KJB	200, 300, 340, 600.....	PR	X	Puget Sound Telephone Co.
Hollywood, Calif. ³	KGC	300, 360, 600.....	PR	X	Electric Lighting Co.
Kahuku, Hawaii (Oahu station). ⁴	KGI	16300.....	PR	N	R. C. of A.
Los Angeles, Calif. ⁵	KYJ	300, 360, 600.....	PR	X	Leo J. Meyberg Co.
Los Angeles, Calif. ⁶	KZC	300, 360, 600.....	PR	X	Western Radio Electric Co.
Marion, Mass. ⁷	WCC	300, 600, 1800.....	PG	N	R. C. of A.
New York, N. Y. ⁸	KUVS	300, 400, 450, 600.....	PR	X	City of New York Police Department.
New York, N. Y. ¹	WDT	300, 360, 600.....	PR	X	Ship Owners' Radio Service.
Oakland, Calif. ²	KZM	300, 360, 600.....	PR	X	Preston D. Allen.
Oakland, Calif. ³	KZY	300, 360, 600.....	PR	X	Atlantic-Pacific Radio Supplies Co.
Omaha, Nebr. ⁴	WOV	360, 485.....	PR	X	R. B. Howell.
Sacramento, Calif. ¹	KVQ	300, 360, 600.....	PR	X	J. C. Hobrecht.
San Francisco, Calif. ²	KDN	300, 360, 600.....	PR	X	Leo J. Meyberg Co.
San Francisco, Calif. ³	KGB	300, 360, 600.....	PR	X	Edwin L. Lorden.
San Francisco, Calif. ⁴	KYY	300, 360, 600.....	PR	X	Radio Telephone Shop.
San Jose, Calif. ¹	KQW	300, 360, 600.....	PR	X	Charles D. Herrold.
Seattle, Wash. ²	KFC	300, 360, 600.....	PR	X	Northern Radio & Electric Co.
Seattle, Wash. ³	KFL	200, 300, 340, 600.....	PR	X	Garrison Babcock.
Silasconset, Mass. ⁴	WSC	300, 450, 600.....	PG	X	R. C. of A.
Stockton, Calif. ⁵	KJQ	300, 360, 600.....	PR	X	C. O. Gould.
Stockton, Calif. ⁶	KWG	300, 360, 600.....	PR	X	Portable Wireless Telephone Co.
Sunnyvale, Calif. ⁷	KJJ	300, 360, 600.....	PR	X	The Radio Shop.
Washington, D. C. ⁸	WDN	300, 360, 600.....	PR	X	Church of the Covenant.
Washington, D. C. ¹	WDW	300, 360, 600.....	PR	X	Radio Construction & Electric Co.
Washington, D. C. ²	WJH	300, 360, 600.....	PR	X	White & Boyer Co.

¹ System, composite (vacuum tube, telephone, and telegraph); rates, none; station used for broadcasting news, concerts, lectures, and such matter.

² System, composite (vacuum tube, telephone); rates, none; station used for broadcasting news, concerts, lectures, and such matter.

³ Loc. 0.157° 58' 33", N. 21° 42' 12"; range, 4000; system, R. C. of A. (Alexanderson alternator, continuous wave); rates, to United States 25 c. per word, to Japan 60 c. per word.

⁴ Loc. 0.70° 46' 30", N. 41° 42' 45"; range, 1000; system, R. C. of A. (v. t., c. w., and i. c. w.); rates, ship service 10c. per word. Distantly controlled from Chatham, Mass. (WCC).

⁵ Range, 300; system, Cutting & Washington, 1000; rates, none.

⁶ System, DeForest (vacuum tube, telephone, and telegraph); rates, none; station used for broadcasting news, concerts, lectures, and such matter.

⁷ Loc. 0.69° 58' 10", N. 41° 16' 35"; range, 300; system, composite, 1000; rates, ship service 10 c. per word.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
All America ¹	KDWF	<i>Cents.</i>	<i>Cents.</i>	PG	N	Mexican Telegraph Co.	Owner of vessel. Do. Do.
Alpha.....	KDWO	.....	.....	.....	.....	E. C. Schroeder.....	
Asher J. Hudson ²	KDWG	8	8	PG	X	Crown Coal & Towing Co.	Do.
Byron D. Benson.....	KDWN	8	8	PG	X	Standard Oil Co. of N. J.	R. C. of A.
Equator.....	KDWI	.....	.....	.....	.....	Cary Davis Tug & Barge Co.	
Lone Star State.....	KDWK	8	8	PG	N	U. S. Shipping Board.	Owner of vessel. S. O. R. S.
Munargo.....	KDWH	.....	.....	PG	N	Munson S. S. Line.	
New Jersey.....	KDWD	.....	.....	PG	X	Texas Co.	Owner of vessel. S. O. R. S.
Spray.....	KDWJ	.....	.....	PG	X	Anthony J. McAllister.	
Steel Navigator.....	KDWL	8	8	PG	X	U. S. Steel Products Co.	Owner of vessel. S. O. R. S.
Wogo ³	KDWM	.....	.....	PR	X	Claud Nolan.....	
Yosemite ⁴	KDWE	8	8	PG	X	Pope & Talbot.....	

¹ Range, 300; system, Cutting & Washington, 1000; w. l., 300, 450, 600.

² Range, 150; system, Cutting & Washington, 1000; w. l., 300, 600.

³ Range, 150; system, composite, 120; w. l., 300, 600.

⁴ Range, 200; system, Killbourn & Clark, 1000; w. l., 300, 600.

Commercial land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDN	San Francisco, Calif.....c	KJJ	Sunnyvale, Calif.....c
KDWD	New Jersey.....b	KJQ	Stockton, Calif.....c
KDWE	Yosemite.....b	KQW	San Jose, Calif.....c
KDWF	All America.....b	KQVS	New York, N. Y.....c
KDWG	Asher J. Hudson.....b	KVQ	Sacramento, Calif.....c
KDWH	Munargo.....b	KWG	Stockton, Calif.....c
KDWI	Equator.....b	KYJ	Los Angeles, Calif.....c
KDWJ	Spray.....b	KYY	San Francisco, Calif.....c
KDWK	Lone Star State.....b	KZC	Los Angeles, Calif.....c
KDWL	Steel Navigator.....b	KZM	Oakland, Calif.....c
KDWM	Wogo.....b	KZY	Oakland, Calif.....c
KDWN	Byron D. Benson.....b	WCC	Marion, Mass.....c
KDWO	Alpha.....b	WDM	Washington, D. C.....c
KFC	Seattle, Wash.....c	WDT	New York, N. Y.....c
KFL	Seattle, Wash.....c	WDW	Washington, D. C.....c
KGB	San Francisco, Calif.....c	WJH	Washington, D. C.....c
KGC	Hollywood, Calif.....c	WMH	Cincinnati, Ohio.....c
KGI	Kahuku, Hawaii (Oahu Station).....c	WOU	Omaha, Nebr.....c
KJB	Everett, Wash.....c	WSC	Siasconset, Mass.....c

Government land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Amagansett, N. Y. ¹	NBM	300, 600, 975, 1851..	PG	N	U. S. Navy.
Portland, Me. ²	NAB	600, 800.....	PG	N	Do.
Soapstone Point, Alaska.	NUW	300, 600.....	PG	N	Do.

¹ Loc. O. 72 07' 50", N. 40 57' 52"; range, 100.

² Loc. O. 70 12' 00", N. 43 33' 58"; range, 100.

NOTE.—The above stations are used exclusively for radio compass work. All naval radio stations are equipped with the Navy's own make apparatus.

Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Nokomis.....	NAMM	U. S. Navy.

Government land and ship stations, alphabetically by call signals.

[b—ship station; c—land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NAB	Portland, Me.....c	NUW	Soapstone Point, Alaska.....c
NBM	Amagansett, N. Y.....c	NAMM	Nokomis.....b

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921.]

Station.	Call signal.	Wave lengths.	Station controlled by—
Albuquerque, N. Mex.....	5YQ	200, 375.....	University of New Mexico.
Boulder, Colo.....	9XAQ	200, 375, variable	University of Colorado.
Cincinnati, Ohio.....	8YAC	200, 375.....	St. Xavier College.
Cincinnati, Ohio.....	8YAD	200, 375.....	C. M. Howe.
Detroit, Mich.....	8YAF	200, 375.....	University of Detroit.
Douglas, Wyo.....	7ZV	200, 375.....	Felix Thompson.
Eagle Rock, Calif.....	6ZAL	200, 375.....	Oliver S. Garretson.
East St. Louis, Ill.....	9ZAG	200, 375.....	Boy Scouts of America.
Highland Park, Mich.....	8XAF	200, 320, 460, 530.	Howard P. Hardesty.
Lamoni, Iowa.....	9YO	200, 350, 425.....	Graceland College.
Los Angeles, Calif.....	6XAQ	200 to 550.....	Lex B. Benjamin.
Mt. Clemens, Mich.....	8XAE	200, 320, 460, 530.	Henry B. Joy.
New York, N. Y.....	2ZG	200, 375.....	National Amateur Wireless Association.
Norman, Okla.....	5XW	200, variable.....	University of Oklahoma.
Oberlin, Ohio.....	8YAE	200, 375.....	Oberlin College.
Ogden, Utah.....	6ZAM	200, 375.....	W. G. Garner.
Philadelphia, Pa.....	3XAD	200, 340.....	Earl L. Norcross
Philadelphia, Pa.....	3ZAC	200, 375.....	Edwin M. Hartley.
Pittsburgh, Pa.....	8ZAE	200, 375.....	Burton P. Williams.
Port Arthur, Tex.....	5XV	200, 250, 375.....	Port Arthur Radio Laboratory.
Roswell, N. Mex.....	5ZAO	200, 375.....	Roswell Public Service Co.
San Francisco, Calif.....	6XO	Variable.....	National Radio Co.
Seattle, Wash.....	7XE	Variable.....	R. C. of A.
Seattle, Wash.....	7YM	200, 375.....	Lincoln High School.
Toledo, Ohio.....	8YAB	200, 375.....	Scott High School.
Tucson, Ariz.....	5YP	200, 375.....	University of Arizona.
Vermillion, S. Dak.....	9YAM	200, 375.....	University of South Dakota.

Special land stations, grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
ZG	Second district: New York, N. Y.		
3XAD	Third district:	8XAE	Eighth district:
3ZAC	Philadelphia, Pa.	8XAF	Mt. Clemens, Mich.
	Do.	8YAB	Highland Park, Mich.
5XV	Fifth district:	8YAC	Toledo, Ohio.
5XW	Port Arthur, Tex.	8YAD	Cincinnati, Ohio.
5YP	Norman, Okla.	8YAE	Do.
5YQ	Tucson, Ariz.	8YAF	Oberlin, Ohio.
5ZAO	Albuquerque, N. Mex.	8ZAE	Detroit, Mich.
	Roswell, N. Mex.		Pittsburgh, Pa.
6XAQ	Sixth district:	9XAG	Ninth district:
6XO	Los Angeles, Calif.	9YAM	Boulder, Colo.
6ZAL	San Francisco, Calif.	9YO	Vermillion, S. Dak.
6ZAM	Eagle Rock, Calif.	9ZAG	Lamoni, Iowa.
	Ogden, Utah.		East St. Louis, Ill.
7XE	Seventh district:		
7YM	Seattle, Wash.		
7ZV	Do.		
	Douglas, Wyo.		

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS.

CHATHAM, MASS. (WCC).—Loc., (approx.) O. 70° 00' 00"; N. 41° 42' 00"; W. l., 300, 450, 600.

KAHUKU, HAWAII (KIE).—System, R. C. of A. (Alexanderson alternator); w. l., 16975.

KENAI, ALASKA.—Range, 20; w. l., 300, 600, 1650; service, PR; hours, 6-7 p. m.; rates, none.

LIMA, OHIO.—Loc., O. 84° 06' 40", N. 40° 45' 20".

NEW LONDON, CONN.—Hours, 6 p. m.-2 a. m.

NEW YORK, N. Y. (WNY).—W. l., 300, 600, 1800.

ROSELLE PARK, N. J.—Range, 200; system, composite, 800 with chopper (V. T. telephone and telegraph); hours, 11 a. m.-12 midnight.

SPRINGFIELD, MASS.—W. l., 360, 500.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ALBERT E. WATTS.—Range, 300; system, R. C. of A., 1000.

ANTINOUS.—System, Kilbourne & Clark, 1000.

ATLANTIC SUN.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.

ATLAS.—Range, 300; w. l., 300, 600.

ARYAN.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.

ASTMAHCO, III.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600.

BABINDA.—Rates, North and South American and transoceanic services, 4 c. per word; station operated and controlled by owner of vessel.

BAYSIDE.—Strike out all particulars.

BELFAST.—Range, 150; system, R. C. of A., 1000; w. l., 300, 450, 600.

BELLEMINA.—System, Navy-Wireless Improvement Co., 1000; hours, X.

BENOWA.—Range, 300; system, Kilbourne & Clark, 1000.

BIRKENHEAD.—Range, 300; system, R. C. of A., 1000.

BOHEMIAN CLUB.—Range, 300; system, Federal arc, w. l., 300, 450, 600, 1800; station operated and controlled by S. O. R. S.

BOOBYALLA.—Range, 300; system, Kilbourne & Clark, 1000; rates, North and South American and transoceanic services, 4 c. per word.

BRAMELL POINT.—W. l., 300, 600.

BROAD ARROW.—Hours, N.

- BUTTERFIELD.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
- CALDAS.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600.
- CAPULIN.—Station operated and controlled by R. C. of A.
- CAROLYN.—Range, 150.
- CARRABULLE.—Station operated and controlled by S. O. R. S.
- C. A. SNIDER.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 600; rates, North and South American and transoceanic services 4 c. per word.
- CASTANA.—Station operated and controlled by S. O. R. S.
- CATAHOULA.—Station operated and controlled by S. O. R. S.
- CERRO-AZUL.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
- CERRO-EBANO.—Range, 150; system, Marconi, 1000; w. l., 300, 450, 600; hours, X.
- CETHANA.—W. l., 300, 600.
- CHARLES M. EVEREST.—W. l., 300, 450, 600.
- CHESTER SUN.—Range, 300; system, Marconi, 1000.
- CITY OF ALMA.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.
- CITY OF DALHART.—Range, 200; system, Navy-International Radio Telegraph Co. 1000; w. l., 300, 450, 600.
- CITY OF RAYVILLE.—Range, 200; system, R. C. of A., 1000; w. l., 300, 450, 600.
- CLARKSBURG.—American-Hawaiian S. S. Co. owner of vessel.
- CLEMENT SMITH.—Range, 300; system, R. C. of A., 1000.
- CLIFFWOOD.—Station operated and controlled by R. C. of A.
- COLDBROOK.—Range, 300; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.
- COLD HARBOR.—Station operated and controlled by R. C. of A.
- COLIN H. LIVINGSTONE.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
- COMET.—Range, 150; system, R. C. of A., 1000.
- COOLCHA.—W. l., 300, 600.
- CRASTER HALL.—Range, 150; system, R. C. of A., 240.
- CURACAO.—System, R. C. of A., 1000.
- DANIEL WEBSTER.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
- DELANSON.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
- DILLWYN.—System, Navy-Lowenstein, 1000.
- DIRECTOR.—Range, 150; system, Navy-Simon, 1000; w. l., 300, 450, 600.
- DISTRICT OF COLUMBIA.—Range, 300; system, Federal arc; w. l., 300, 600, 1800.
- DONNA LANE.—Range, 200; system, composite, 480; station operated and controlled by owner of vessel.
- DUNGANNON.—Station operated and controlled by R. C. of A.
- EASTERN BREEZE.—Station operated and controlled by R. C. of A.
- EASTERN MOON.—Range, 200; hours, X.
- EASTERN TEMPEST.—Station operated and controlled by R. C. of A.
- EASTERN PLANET.—Station operated and controlled by S. O. R. S.
- EDITOR.—Station operated and controlled by R. C. of A.
- EDWARD L. DOHENY, JR.—Range, 300; system, R. C. of A., 1000.
- ELISHA WALKER.—Range, 300; system, R. C. of A., 1000.
- EL SOL.—W. l., 300, 600; hours, X.
- EMERGENCY AID.—Range, 300; system, Federal arc; w. l., 300, 600, 1800.
- ERNEST H. MEYER.—System, Gray & Danielson, 1000.
- ESTRADA PALMER.—Range, 150; system, R. C. of A., 1000.
- E. T. BEDFORD.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600; hours, X.
- E. W. SINCLAIR.—Range, 300; system, R. C. of A., 1000.
- F. H. HILLMAN.—Range, 300; system, R. C. of A., 1000.
- FLEETCO.—Strike out all particulars.
- GATEWAY CITY.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
- GENESEE.—Arthur L. Crowley owner of vessel.

- GLADYSBE.—Station operated and controlled by S. O. R. S.
- GRIFFDU.—Station operated and controlled by S. O. R. S.
- HALF MOON (KUVX).—Station operated and controlled by R. C. of A.
- HALO.—W. l., 300, 600, 1800.
- HAMER.—Range, 300; system, Federal arc; w. l., 300, 450, 600, 1800.
- H. C. FOLGER.—Range, 300.
- HENRY S. GROVE.—Range, 300; system, Federal arc; w. l., 300, 600, 1800.
- HERMAN FRASCH.—Station operated and controlled by S. O. R. S.
- H. M. STOREY.—Station operated and controlled by R. C. of A.
- H. M. WHITNEY.—System, Marconi, 240.
- HOOSIER STATE.—Range, 1000; system, Federal arc, 1000 with chopper; w. l., 300, 450, 600, 1800; station operated and controlled by S. O. R. S.
- HOUMA.—System, Navy-Marconi, 1000; w. l., 300, 450, 600.
- HUMBOLDT.—Fred Linderman, owner of vessel.
- H. T. HARPER.—Range, 300; system, R. C. of A., 1000; w. l., 300, 600.
- HYADES.—Range, 150; w. l., 300, 600.
- JAMES MCGEE.—System, R. C. of A., 1000.
- JENNIE R. MORSE.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600.
- J. N. PEW.—Range, 300; system, R. C. of A., 1000.
- JOHN D. ROCKEFELLER.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
- JOSEPH M. CUDAHY.—Range, 150; system, Navy-Marconi, 1000.
- J. W. VAN DYKE.—Range, 300.
- KENNECOTT.—Station operated and controlled by S. O. R. S.
- KING AND WINGE.—Range, 150; system, Kilbourne & Clark, 1000; w. l., 300, 425, 600; rates, North and South American services, 6 c. per word; station operated and controlled by owner of vessel.
- LAKE DEVAL.—System, Navy-Marconi, 1000.
- LAKE FABYAN.—W. l., 300, 450, 600.
- LAKE FANNIN.—Range, 200; system, Navy, 1000; w. l., 300, 450, 600.
- LAKE FERNANDO.—W. l., 300, 450, 600.
- LAKE GALATA.—System, Navy-Simon, 1000; w. l., 300, 450, 600.
- LAKE GRAVETT.—System, Navy-Marconi, 1000; w. l., 300, 450, 600.
- LA PURISIMA.—Range, 150; system, Federal arc, 1000 with chopper; w. l., 300, 600, 1800; rates, North and South American and transoceanic service, 8 c. per word; station operated and controlled by Federal Telegraph Co.
- LIEBRE.—Range, 300; w. l., 300, 600; rates, North and South American and transoceanic services, 4 c. per word; station operated and controlled by owner of vessel.
- LIGHTBURNE.—System, Navy-Wireless Specialty Apparatus Co., 1000.
- LILMAE.—Station operated and controlled by S. O. R. S.
- MANOA (WMQ).—Range, 300.
- MASON CITY.—Range, 200; system, Navy-Simon, 1000.
- MERIDEN.—Rates, North and South American and transoceanic services, 8 c. per word.
- MEXICAN.—Range, 300; w. l., 300, 450, 600.
- MINNEQUA.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.
- MORAVIA BRIDGE.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.
- NARWHAL.—Range, 150; system, Wireless Specialty Apparatus Co., 1000; rates, North and South American services, 4 c. per word.
- NEW YORK (KSN).—Worden & Co., owner of vessel.
- NYANZA.—Range, 200.
- OSSINING.—Range, 300; system, Navy-Liberty, 1000; w. l., 300, 450, 600.
- PARAGUAY.—System, R. C. of A., 1000.
- PASTORES.—Range, 300.
- PEARLDON.—Station operated and controlled by S. O. R. S.

- PHILIP PUBLICKER.—Range, 150; system, Cutting & Washington, 1000; w. l., 300, 450, 600.
- PIPESTONE COUNTY.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.
- POLAR STAR.—W. l., 300, 450, 600.
- PRINCESS.—Archibald M. Ostrom, owner of vessel.
- PRUSA.—W. l., 300, 450, 600.
- PUENTE.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
- PULWICO.—Station operated and controlled by R. C. of A.
- PYLOS.—Strike out all particulars.
- PYTHON.—Range, 200; system, Navy-Simon, 1000; w. l., 300, 450, 600.
- REDONDO (WBM).—Station operated and controlled by S. O. R. S.
- ROYAL ARROW.—Hours, N.
- ROBERT P. CLARK.—Range, 200; system, I. W. T. Co., 1000; w. l., 300, 450, 600.
- RUTH E. MERRILL.—Station operated and controlled by owner of vessel.
- SAGAPORACK.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.
- SAMUEL Q. BROWN.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
- SAN JUAN.—Station operated and controlled by S. O. R. S.
- SANTORE.—Range, 300; w. l., 300, 450, 600.
- SARAMACA.—Range, 200; w. l., 300, 450, 600.
- SENATOR BAILEY.—System, I. W. T. Co., 1000; w. l., 300, 450, 600.
- SEWALLS POINT.—Range, 300; hours, X.
- SHENANDOAH.—System, Navy-Lowenstein, 1000.
- STANDARD ARROW.—Hours, N.
- STEEL SCIENTIST.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600; station operated and controlled by R. C. of A.
- STEEL TRADER.—Hours, X.
- STEEL VOYAGER.—Station operated and controlled by S. O. R. S.
- SUN.—Range, 300; system, R. C. of A., 1000.
- SUNBEAM.—System, Navy-Marconi, 1000.
- SYLVAN ARROW.—Hours, N.
- TIPPECANOE.—Range, 300; system, Fessenden, 1000; w. l., 300, 450, 600; hours, X; station operated and controlled by R. C. of A.
- TOMALVA.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.
- TULSAGAS.—Range, 300; system, Federal arc; w. l., 300, 600, 1800.
- TRI MOUNTAIN.—Station operated and controlled by I. W. T. Co.
- VIRGINIA.—W. l., 300, 600.
- VOLANT.—Range, 150; system, R. C. of A., 1000.
- WEST CHOPAKA.—Station operated and controlled by S. O. R. S.
- WEST COBALT.—System, Navy-Marconi, 1000; w. l., 300, 450, 600.
- WESTERN KING.—Range, 300; system, Marconi, 1000; w. l., 300, 450, 600; hours, N.
- WESTERN PLAINS.—Station operated and controlled by R. C. of A.
- WEST KATAN.—Station operated and controlled by R. C. of A.
- WEST NOSSKA.—Station operated and controlled by R. C. of A.
- WEST PROSPECT.—Range, 300; system, Federal arc; w. l., 300, 450, 600, 1800.
- WHEATON.—System, Navy-Marconi, 1000; w. l., 300, 450, 600.
- W. H. LIBBY.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
- WILLPOLO.—System, Navy-Wireless Improvement Co., 1000.
- WINDING GULF.—System, Navy-Lowenstein, 1000.
- WM. ROCKEFELLER.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
- WOODMANSIE.—Station operated and controlled by R. C. of A.
- YOUNGSTOWN.—System, Navy-Marconi, 1000; w. l., 300, 450, 600; hours, X.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals KDDX, KULQ, and KURK.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations, of the United States, edition of June 30, 1921.]

ANACOSTIA, D. C.—W. 1., 507.
 BOSTON, MASS. (NAD).—W. 1., 600, 975, 1620, 3950, 5000.
 CALUMET, MICH.—Name changed to Eagle Harbor, Mich.
 CAPE MAY, N. J.—W. 1., strike out 507 and 2750.
 CHATHAM, MASS.—W. 1., 600, 975, 1870.
 CLEVELAND, OHIO (NRH).—W. 1., 600, 1080, 3800, 4250.
 COCO SOLO, Canal Zone.—W. 1., strike out 600.
 EUREKA, CALIF.—W. 1., strike out 2400.
 FARRALONS, CALIF.—Strike out all particulars.
 GREAT LAKES, ILL.—W. 1., 600, 1988, 3800, 3950, 4900.
 KETCHIKAN, ALASKA.—W. 1., 600, 975, 1870, 2400, 4525, 5000.
 LAKEHURST, N. J.—W. 1., 507.
 MANATI, CUBA.—Strike out all particulars.
 MARSHFIELD, OREG.—W. 1., 600, 975, 1948, 2400.
 NAVAL ACADEMY, ANNAPOLIS, MD.—Station temporarily out of commission.
 NORFOLK, VA.—W. 1., strike out 2950.
 NORTH HEAD, WASH.—W. 1., strike out 2400.
 PARRIS ISLAND, S. C.—W. 1., strike out 975.
 POINT ARGUELLO, CALIF.—Strike out all particulars.
 QUANTICO, VA., W. 1., 507, 600.
 SAN FRANCISCO, CALIF. (NPG).—W. 1., 150, 600, 975, 1908, 2400, 2900, 3950, 4650, 4800, 7900.
 SAN PEDRO, CALIF.—W. 1., 150, 365, 600, 975, 1851, 2400, 2750, 3950, 4525.
 SAVANNAH, GA.—W. 1., strike out 975.
 SAYVILLE, N. Y.—W. 1., 9145.
 SEATTLE, WASH.—W. 1., 600, 700, 975, 2400.
 ST. CROIX, VIRGIN ISLANDS.—W. 1., 450, 600.
 ST. PETERSBURG, FLA.—W. 1., 600, 975, 2400, 2700, 3700, 3950.
 TATOOSH, WASH.—W. 1., 600, 975, 1654.
 VIRGINIA BEACH, VA.—W. 1., 507.
 WASHINGTON, D. C. (Arlington) (NAA).—W. 1., strike out 600, 975.
 WASHINGTON, D. C. (Navy Yard) (NAL).—W. 1., strike out 600, 975, 2250.

NOTE.—Naval Stations having only one wave length use the one wave length for "listening in" and transmitting.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations, of the United States, edition of June 30, 1921.]

COLUMBIA (NGA).—Strike out all particulars.
 GREAT NORTHERN.—Name changed to Columbia.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals NGA, NMB, NPI, and NPK;
 NUG, *read* Eagle Harbor, Mich.; NAXL, *read* Columbia.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

BOSTON, MASS. (1YS).—W. 1., 200, 375.
 CLIFTON, N. J. (2ZM).—Strike out all particulars.
 COLLEGE STATION, TEX. (5YF).—Strike out all particulars.

EVANSVILLE, IND. (9XAH).—W. I., 200, 210, 375.
 LOS ANGELES, CALIF. (6XAO).—Strike out all particulars.
 NEW ORLEANS, LA. (5ZP).—Strike out all particulars.
 NEW YORK, N. Y. (2XNB).—W. I., 325.
 PORT CHESTER, N. Y. (2ZE).—Read Cedar Grove, N. J.
 PRINCETON, N. J. (2XU).—W. I., variable.
 SAN ANTONIO, TEX. (5ZAK).—R. C. Walkeen owner of station.
 SAN FRANCISCO, CALIF. (6ZAI).—Strike out all particulars.
 ST. LOUIS, MO. (9XS).—W. I., variable.
 ST. MARYS, OHIO (8ZL).—W. I., 200, 375.
 TACOMA, WASH. (7ZL).—Strike out all particulars.

MISCELLANEOUS.

USE OF 800 METERS.

Radio operators are cautioned that the use of 800 meters for commercial messages is in violation of the act of August 13, 1912, and the International Convention service regulations. This wave length is reserved exclusively for radio compass work. Any operator using 800 meters for commercial traffic may expect to have his license suspended or revoked.

AMENDMENTS TO REGULATIONS.

To radio inspectors and others concerned:

Paragraph 57, page 55, amended December 1, 1921, to read:

CLASS 2.—Limited commercial stations are not open to public service and are licensed for a specific commercial service or services defined in the license. Stations of this class must not transmit to or accept public messages from other stations. No rates are authorized. *Licenses of this class are required for all transmitting radio stations used for broadcasting news, concerts, lectures, and such matter. A wave length of 390 meters is authorized for such service, and a wave length of 485 meters is authorized for broadcasting crop reports and weather forecasts, provided the use of such wave lengths does not interfere with ship to shore or ship to ship service.*

Paragraph 58, page 55, which reads: "If a coast station, the operators shall hold a commercial second-grade license, or higher" (par. 57) is amended, effective January 10, 1922, to read: "*Operators of limited commercial stations shall hold a commercial second-class license or higher.*"

D. B. CARSON, *Commissioner of Navigation.*

Approved.

HERBERT HOOVER, *Secretary of Commerce.*

COUNTERFEIT WEATHER FORECASTS.

Whoever shall knowingly issue or publish any counterfeit weather forecast or warning of weather conditions falsely representing such forecast or warning to have been issued or published by the Weather Bureau, United States Signal Service, or other branch of the Government service, shall be fined not more than \$500 or imprisoned not more than 90 days, or both. (Act of Mar. 4, 1909, c. 321, 35 Stat., 1088).—*Submitted by Weather Bureau.*

RADIO WEATHER SERVICE FROM KIIRUN, JAPAN.

A radio weather bulletin and storm-signal service has been instituted at Kiirun radio station, in latitude 25° 08' N., longitude 121° 45' E., call letters JFK and wave length 600 meters. This station transmits daily a weather bulletin at 11.30 G. M. T. (civil) and storm signals at 12.05 G. M. T. (civil). The station also transmits the warnings issued by the Central Meteorological Observatory at Tokyo immediately after being received. No charge is made except in cases where the warnings are transmitted specially at the request of ships. The messages are sent out in English and are transmitted three times in succession, each being preceded by the signal QST sent three times. The warnings contain the following: Typhoon or low atmospheric pressure, date, time, position of center, reading of barometer at center, and direction of progressive motion; or locality, warning, and remarks.—*From Hydrographic Bulletin, Dec. 7, 1921.*

HIGH-POWER RADIO INSTALLATIONS, BRAZIL.

Two high-power radio stations are shortly to be established in Brazil, each being equipped with a 1,000-kilowatt Alexanderson high-frequency generator. One of these stations is being erected at Rio de Janeiro to communicate directly with Europe; the other is being erected at Para to communicate with the United States.—*From Hydrographic Office, Dec. 7, 1921.*

RADIO TIME SIGNALS, EIFFEL TOWER, FRANCE.

From November 15, 1921, the automatic radio time signals from Eiffel Tower radio station are preceded by a series of the letter "V" sent from 0923 to 0924, then the words "Observatoire de Paris," sent from 0925 to 0926. The instants 0928, 0929 are indicated by the end of a group of three dashes, according to the cadence adopted by the International Time Conference of 1912. The semiautomatic radio time signals from this station indicate, by means of a dot, the instants 1045, 1047, and 1049; also 2245, 2247, and 2249, according to the cadence of the old-time signals from Eiffel Tower radio station.—*From Hydrographic Office, Dec. 21, 1921.*

RADIO COMPASS STATIONS, PEN-AR-ROCH, FRANCE.

The service of the radio compass station at Pen-ar-Roch, Ouessant, in (approximately) latitude $48^{\circ} 26' 27''$ N., longitude $5^{\circ} 05' 37''$ W., has been resumed.—*From Hydrographic Office, Dec. 21, 1921.*

INFORMATION FROM THE BERNE INTERNATIONAL BUREAU.

Italy.—By letter of September 29 last the Italian office states there has been established a regulation by which each ship which is in need of a compass bearing asks the coast station interested the coast charge to be paid for the service. Also, in order to have a way of checking in case of dispute, the coast station, as well as the ship station, transcribes the bearing on a radiotelegram form. The radio station of Brindisi will be closed to public service beginning December 15, 1921. The service of this station will be assumed by the S. Cataldo di Bari station.

Portugal.—The coast station of Lisbonne (Lisbon) is reopened to service.

France.—The legal hour was reestablished during the night of October 25-26 last.

Belgium.—The legal hour was reestablished during the night of October 25-26 last.

Persia.—The rate for the stations of Bahrein, Bushire, Hengam, and Lingah is 0 fr. 60 per word, beginning December 1, 1921.

APPLICATIONS OF RADIO TELEPHONY IN THE LIFE-SAVING SERVICE USING A COIL ANTENNA.

The Bureau of Standards has been cooperating with the United States Coast Guard in the development of radio telephone apparatus to maintain communication between a motor lifeboat and a shore station. The great importance of maintaining reliable communication between the shore and a boat engaged in rendering assistance to a wrecked ship is obvious. The proper navigation of such a boat in a storm makes it highly desirable to reduce to a minimum any apparatus above the deck level. No loose wires above, in, or under the boat were permissible, since this would interfere with the proper handling of the boat and the throwing of lines. The installation of a small antenna of the ordinary elevated type even a comparatively small distance above the deck would be very undesirable from a navigating point of view. After considerable investigation it was decided that a coil antenna offered the best prospects.

A coil antenna need not be insulated from the earth to give good results. Two vertical pipes, grounded at each end and having a connection made across their upper ends, have been successfully used as a coil antenna. Several years ago two members of the staff of the Bureau of Standards developed a coil antenna for use on a submarine, consisting of a single wire elevated a short distance above the submarine and con-

nected at each end to the metallic hull of the vessel. The vessel was thus equipped with a single-turn coil antenna of which the hull formed a part, and successful communication has been carried on with a submarine so equipped.

A similar arrangement has been used on the motor lifeboat for the Coast Guard. The boat on which the installation was made was a 36-foot gas-engine driven boat equipped with a heavy metal keel. The receiving and transmitting set was installed on the boat as far forward as possible. From the set a wire was run forward and connected to the keel, while two wires, heavily insulated, were run aft along the guards and connected to the keel. A particular kind of a coil antenna was thus formed, of which the keel constituted a part. This arrangement was satisfactory from a navigating point of view.

The transmitting apparatus used at the shore station and on the boat were identical and consisted of a 5-watt radio telephone transmitting set. The wave length used for transmission from the boat was 380 meters, and the wave length used for transmission from the shore station was 675 meters. The receiving equipment used included an amplifier, using three stages of radio-frequency amplification and two stages of audio-frequency amplification, and was specially designed for the wave length used. The apparatus installed on the boat can be made very compact.

On November 15 a demonstration was made at Atlantic City before representatives of the Coast Guard on a Coast Guard motor lifeboat equipped with this type of apparatus. When the boat was 6 miles from shore, good communication was maintained with the shore station. This distance is sufficient for the ordinary needs of the Coast Guard. If a greater distance is to be covered, it will, of course, be possible to use a transmitting set more powerful than the small 5-watt set used in these tests. The results of the tests were regarded as very satisfactory.

Consideration is being given by the Coast Guard to the installation of radio telephone equipment at a number of the more important stations.—*Submitted by Bureau of Standards, Nov. 30, 1921.*

WEATHER REPORTS.

Masters of all vessels are reminded that all communications concerning weather should be forwarded to the Weather Bureau, Washington, D. C., and if sent by radio or telegraph should be addressed "Govt. Observer." Under the subject "Weather" should be included all information of a meteorological nature, including reports on barometric pressures, winds, force and direction, and movements of all air strata. Forms and instructions for reports can be obtained from the Weather Bureau, Washington, D. C.

All hydrographic information, which includes reports on ice, wrecks, derelicts, floating obstructions, and important changes in aids to navigation, should be addressed to the Hydrographic Office and any of its branch offices by mail, and to any of the following naval radio stations by radio, addressed "Govt. Hydro."

United States naval radio stations.	Call letters.	United States naval radio stations.	Call letters.
<i>Atlantic Ocean.</i>		<i>Pacific Ocean.</i>	
Boston.....	NAD	Balboa.....	NBA
New York.....	NAH	San Francisco.....	NPG
Philadelphia.....	NAI	North Head.....	NPE
Norfolk.....	NAM	Seattle.....	NVL
Baltimore.....	NBZ		
Charleston.....	NAO		
New Orleans.....	NAT		
Galveston.....	NKB		
St. Thomas, Virgin Islands.....	NAV		
San Juan.....	NBB		
Navassa Island.....	NAW		
Guantanamo, Cuba.....	NKC		
Colon.....	NAX		
		<i>Great Lakes.</i>	
		Duluth.....	NUX
		Chicago.....	NVR
		Buffalo.....	NNZ
		Cleveland.....	NRH

Hydrographic Bulletin, Dec. 14, 1921.

RADIO ICE SIGNALS, SWEDEN.

Radio ice signals for the coast of Sweden are transmitted daily at 13.15 (middle European time) by Karlsbörns radio station, on a 2,500-meter wave length. The signals are transmitted according to the following code:

Main group AA.			Main group BB.		
Group I.	Group II.	Group III.	Group I.	Group II.	Group III.
AA IS IS IS	IS IS IS	IS IS IS	BB IS IS IS	IS IS IS	IS IS IS
Main group CC.			Main group DD.		
Group I.	Group II.	Group III.	Group I.	Group II.	Group III.
CC IS IS IS	IS IS IS	IS IS IS	DD IS IS IS	IS IS IS	IS IS IS

The letter "I," replaced by either a figure or the letter "x," signifies ice, as below; the letter "e," replaced by either a figure or the letter "x," signifies effects on navigation, as below:

Ice reports.

- | | |
|---------------------|------------------------|
| 0=Clear of ice. | 6=Difficult land ice. |
| 1=Brash ice. | 7=Difficult drift ice. |
| 2=Spread drift ice. | 8=Pack ice. |
| 3=Floe ice. | 9=Hummocky ice. |
| 4=Land ice. | x=Not known. |
| 5=Drift ice. | |

Effects on navigation.

- 0=Open for navigation.
 1=Navigation difficult for sailing vessels.
 2=Navigation difficult but practicable for sailing vessels assisted by tugs.
 3=Navigation closed to sailing vessels.
 4=Navigation only practicable for powerful steamers.
 5=Navigation only practicable with the assistance of ice breakers.
 6=Channel kept open by ice breakers.
 7=Navigation closed.
 8=Navigation held up.
 9=Conditions not known on account of fog, snow, etc.
 x=Not known.

Channels and districts for which the signals are given.

Main group.	Subgroup.	Number or letter "x" in subgroups.	Channels and districts.
A.A.	I.	1st and 2d. 3d and 4th. 5th and 6th.	Channel from sea to Karlsborg. Waters outside of Rödkallem. Channel to Lulea through Tjeuholms-sundet.
	II.	1st and 2d. 3d and 4th. 5th and 6th.	Waters outside of Gäsören. West Quarken. Waters outside of Skag.
	III.	1st and 2d. 3d and 4th. 5th and 6th.	Waters outside of Härnö. Angermanälven above Svanö. Angermanälven below Svanö.
B.B.	I.	1st and 2d. 3d and 4th. 5th and 6th.	Waters outside of Bremö. Channel: Bremö to Draghällans Light. Alnösundet.
	II.	1st and 2d. 3d and 4th. 5th and 6th.	Waters outside of Lilljungafrun. Waters around Eggegrund. North channel to Gefle.
	III.	1st and 2d. 3d and 4th. 5th and 6th.	Oregrundsgrepen. Waters in sight of Grundkallen Light Vessel. Waters outside of Söderarm.
C.C.	I.	1st and 2d. 3d and 4th. 5th and 6th.	Waters outside of Sandhamn. Channel: Sandhamn to Stockholm. Waters outside of Landsort.
	II.	1st and 2d. 3d and 4th. 5th and 6th.	Channel: Landsort to Stockholm. Channel: Hävrings to Orelösund. Kalmarsund, north of Kalmar.
	III.	1st and 2d. 3d and 4th. 5th and 6th.	Kalmarsund, south of Kalmar. Southern entrance to Kalmarsund. Waters outside of Kalshamn.
D.D.	I.	1st and 2d. 3d and 4th. 5th and 6th.	Southern entrance to Oresund. Flint Channel. Waters outside of Helsingborg.
	II.	1st and 2d. 3d and 4th. 5th and 6th.	Northern entrance to Oresund. Waters outside of Halmstad. Waters outside of Varberg.
	III.	1st and 2d. 3d and 4th. 5th and 6th.	Waters outside of Vinga. Channel: Vinga to Gothenborg. Waters outside of Smögen.

In each subgroup the first and second figures, the third and fourth figures, and the fifth and sixth figures are given together, or in place of a figure the letter "x."

The conditions for a channel or district is found by looking up the two figures, or in the place of a figure the letter "x," in its respective main group and subgroup. When conditions are the same in all channels and districts under one main group, for example, clear of ice, open for navigation, only main group letters are given, followed by the figures as "AA 00." If the conditions should be the same in all channels and districts in several main groups, the letters of the main group would be sent out, followed by the figures indicating the conditions, as "CC DD 00."

Information is also sent when any of the principal light vessels or buoys on the coast has been withdrawn or are not functioning and of wrecks that constitute a danger to navigation. The radio information is given thus: First, the preliminary signal (—.—.—) to call attention; then the call signal for all stations from Karlsborgs Radio Station (CQ CQ CQ de SAJ SAJ SAJ) repeated three times, and thereafter the words "Swedish ice report," with the information following:

For example:

—.—.— CQ CQ CQ de SAJ SAJ SAJ CQ CQ CQ de SAJ SAJ SAJ CQ CQ CQ de
SAJ SAJ SAJ Swedish ice report AA x8 BB x8 x8 x8 23 64 65 xx 00 CC DD 00.

Then information concerning light vessels and light buoys follows.

Signification:

(For places under main group AA)—

Ice conditions not known.

Navigation held up.

(For places under main group BB, Subgroup I)—

Ice conditions not known.

Navigation held up.

Waters outside of Lilljungfrun:

Ice conditions not known.

Navigation held up.

Waters around Eggegrund:

Spread drift ice.

Navigation closed to sailing vessels.

North Channel to Gefle:

Difficult land ice.

Navigation only practicable for powerful steamers.

Oregrundsgrepen:

Difficult land ice.

Navigation only practicable with assistance of ice breakers.

Waters within sight of Grundkallen Light Vessel:

Not known.

Not known.

Waters outside of Soderarm:

Clear of ice.

Open for navigation.

(For places under main groups CC and DD):

Clear of ice.

Open for navigation.

Information concerning light vessels, buoys, and wrecks are sent in English.

RADIO COMPASS STATION, VINGA ISLAND, SWEDEN.

Vinga Island Radio Compass Station in (approximately) latitude $57^{\circ} 08' N.$, longitude $11^{\circ} 36' 10'' E.$, is now in operation. It is controlled by the coast station (Gothenburg) call letters SAB, which operates on a 600-meter wave length.

Vessels desiring bearings should call Gothenburg radio station and send out QTE (What is my true bearing?) and then await instructions. Gothenburg radio station will send the results by sending out QTE (the true bearing of your vessel from ——— is ——— degrees), followed by the compass station's call letters SAL and a group of three figures, from 000 to 359, for the bearing from the compass station. As soon as the bearing is received the vessel should acknowledge its receipt in the usual manner and give the regulation signal for the end of the message, which will be repeated by the Gothenburg station. Bearings are furnished free on 600-meter wave lengths. No responsibility is assumed for inexact information.

As an aid to the work performed by the radio compass station the following information should be sent to Kungl. Telegrafstyrelsens Radiolyra, Stockholm 2:

(a) Vessel's name.

(b) Radio compass station's name.

(c) Date and time (G. M. T.) when vessel received bearing.

(d) Bearing given by radio compass station.

(e) Vessel's position when bearing was received, determined in some other manner.

(f) The probable accuracy of the calculated position.

(g) Weather conditions at the time.

(h) Eventual remarks.

(i) Captain's or observer's signature.

—From *Hydrographic Bulletin*, Dec. 14, 1921.

RADIO COMPASS STATIONS INSTRUCTIONS.

The Naval Communications Service will furnish radio bearings to mariners of all vessels equipped with radio telegraph transmitters. While the use of these bearings should not lead a mariner to neglect other precautions, such as the use of the lead, etc., during a fog, these bearings will greatly reduce the dangers to navigation for mariners who are compelled for any reason to proceed during foggy or misty weather. These radio compass stations are provided, primarily, to assist the mariner in closing the land during fog or poor visibility, but they may also be used to obtain the positions of vessels at sea in radio compass range, about 150 miles, when for any reason positions can not be obtained by other means.

The maximum distance for which bearings from these stations are accurate is 150 miles. But accurate positions can not be plotted when more than 50 miles from the shore on Mercator charts, for the Mercator projection introduces a distortion of the true bearing. Charts based on Gnomonic projection are essential to plot correctly long-distance radio bearings. Such charts are now under construction by the Hydrographic Office, and until they are available mariners may use the Mercator chart for long-distance bearings, applying necessary corrections, which may be obtained by various methods, one of which is fully explained on the backs of H. O. Pilot Charts of the North Atlantic Ocean for February, 1921; North Pacific Ocean for May, 1921; Indian Ocean for June, 1921; and Central American waters for March, 1921.

Radio compass stations are divided into two classes:

(a) Single stations, operating independently and furnishing a single bearing. These stations are located with the view of giving service to ships at a distance of not over 150 miles from the station.

(b) Harbor entrance groups. All stations in harbor entrance groups are connected to and controlled by the master station. All stations of the group take bearings simultaneously, and these bearings are transmitted to the ship requesting them by the control station. The purpose of these stations is to lead mariners to the light vessels off harbor entrances.

Where only one radio compass station is available, the mariner may fix his position by two or more bearings from the station with the distance run between or may use the bearing as a line of position or as a danger bearing. Or the bearing may be crossed with a line of position obtained from an observation of an astronomical body to establish a fix.

Wave lengths.—All independent and group radio compass stations keep watch on 800 meters. Only this wave should be used to call and work with these stations.

Calling a radio compass station.—To obtain a bearing from independent radio compass stations, call the station from which the bearing is desired in the usual manner and request bearings by means of the conventional signal given hereafter. Simultaneous bearings from two or more compass stations can be obtained by making the call include the other compass stations desired. To obtain bearings from the harbor entrance, compass stations carry out the procedure previously given. The compass control station only will answer.

Conventional signals.—The following abbreviated signals will be used:

Signal.	Meaning.
QTE.....	What is my true bearing?
QTE.....	Your true bearing is — degrees from — radio compass station.

(a) *Procedure in detail.*—A ship calling the radio compass station or compass control station should make the abbreviation "QTE," ("What is my bearing?"). This request will be answered by the radio compass station or control station, and when ready to observe the radio bearing it will send the signal "K," indicating to the ship to commence "testing;" i. e., repeating its distinguishing signal for a period of 50 seconds. The signal should be made slowly with the dashes considerably prolonged.

(b) The testing should be made on 800 meters, upon the completion of which the ship should await reply from the radio compass station.

(c) The radio compass station or control station will then reply, repeating the abbreviation "QTE," ("Your bearing from _____ was _____ degrees"), followed by the bearing in degrees given by a group of three figures 000 to 359, indicating the true bearing in degrees of the ship station from the radio compass station, and then the time group giving the time of observations in local standard time. In the case of more than one radio compass connected by land line only the station originally called will answer. This station will combine all the bearings taken by itself and associated station into one message, which gives each bearing observed immediately after the name of the station making the observation.

All radio compass stations transmit on 800 meters.

Example.—A ship (call letters KVA) desires to get bearings from the Delaware Bay entrance group (call letters NSD). The following procedure is used:

```

— . . . . NSD NSD NSD — . . . KVA KVA KVA — . . . . QTE
. . . . . AR
— . . . . KVA — . . . . NSD K
— . . . . NSD — . . . . KVA — . . . . QTE — . . . . KVA KVA KVA
_____ (making call letters KVA for 50 seconds prolonging the dashes)
— . . . . KVA AR
— . . . . KVA — . . . . NSD — . . . . QTE
Cape May 120, Cape Henlopen 110, Bethany Beach 085 at 0126 — . . . .
NSD AR
— . . . . NSD — . . . . KVA — . . . . 120 110 085 at 0126 — . . . . AR
— . . . . KVA — . . . . NSD R — . . . . NSD

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This method is the only authorized procedure for calling, answering, and testing and should be followed exactly. Such signals as MO — V — and other test signals are not authorized for radio compass traffic. The testing period of 50 seconds should not be exceeded. Mariners who do not follow the prescribed procedure exactly occasion delay to themselves in obtaining bearing and to other mariners who may be waiting for an opportunity to use the radio compass stations.

Danger from reciprocal bearings.—Attention is invited to the fact that when a single bearing is furnished there is a possibility of an error of approximately 180 degrees, as the operator at the compass station can not always determine on which side of the station the vessel lies. Certain radio compass stations, particularly those on islands or extended capes, are equipped to furnish two corrected true bearings for any observation. Such bearings when furnished vessels may differ by approximately 180 degrees, and whichever bearing is suitable should be used.

Caution.—Mariners receiving bearings which are evidently the approximate reciprocal of the correct bearing should never attempt to correct these bearings by applying a correction of 180 degrees, as such correction would not include the correction necessary on account of deviation at the compass station. An error as large as 30 degrees may be introduced by mariners applying an arbitrary correction of 180 degrees to such bearings. Vessels receiving bearings manifestly requiring an approximate 180-degree correction should request the other bearing from the radio compass station if not previously furnished.

Bearings, except in the case of approximate reciprocal bearings, should be accurate within 2 degrees of arc provided the transmitting equipment on board vessels is tuned sharply to 800 meters. Operators should use sufficiently wide coupling to obtain low decrement. If radio transmitters are not tuned sharply, it is difficult to obtain bearings that are sufficiently accurate for navigational purposes. When bearings from three or more compass stations are not over 2 degrees of arc in error, but do not meet at a fixed point, the geometric center of the triangle formed by the bearings can generally be taken as the approximate position of the vessel.

Mariners until thoroughly familiar with the system are advised to use radio compass stations frequently, especially in clear weather, when positions of vessels can be accurately fixed in order to accustom operators to the procedure and to acquaint themselves with the degree of accuracy and dependability of bearings furnished by the radio compass stations.

Reports.—In order that the operation of shore radio compass stations may be checked, mariners obtaining bearings are requested to forward a brief report to the Director Naval Communications, Navy Department, Washington, D. C., containing the following particulars:

1. Name of ship.
2. Name of radio compass station.
3. Date and local standard time at which radio bearing was taken.
4. Bearing given by radio compass station.
5. Estimated position of ship at above time and dates by methods other than radio.
6. The probable degree of accuracy of the estimated position.
7. Weather conditions at above time.
8. Remarks, if any.
9. Signature of master or responsible navigating officer.

There is no charge for bearings furnished by the United States naval radio compass stations.

RADIO COMPASS STATIONS.

The following stations are within the continental limits of the United States:

Name of station.	Call letters.	Position.		
<i>Atlantic coast.</i>				
Bar Harbor.....	NBD	44	18	36 N.
Cape Elizabeth (Portland), Me.....	NAB	63	11	27 W.
Gloucester, Mass.....	NAD	43	33	59 N.
Deer Island, Mass.....	NAD	70	11	59 W.
Fourth Cliff, Mass.....	NAD	42	35	19 N.
North Truro, Mass.....	NAD	70	41	08 W.
Chatham, Mass.....	NAD	42	21	15 N.
Surfside (Nantucket), Mass.....	NAD	70	57	30 W.
Prices Neck, R. I.....	NAE	42	09	40 N.
Amagansett (Long Island), N. Y.....	NAE	70	42	22 W.
Fire Island (Long Island), N. Y.....	NXA	42	02	23 N.
Sandy Hook, N. J.....	NXA	70	03	37 W.
Mantoloking, N. J.....	NBX	41	42	48 N.
Cape May, N. J.....	NBX	69	57	53 W.
Cape Henlopen, Del.....	NAF	41	14	42 N.
Bethany Beach, Del.....	NAF	70	05	56 W.
	NBM	41	27	06 N.
	NBM	71	20	15 W.
	NAH	40	58	10 N.
	NAH	72	07	27 W.
	NAH	40	38	07 N.
	NAH	73	12	32 W.
	NAH	40	27	54 N.
	NAH	73	59	50 W.
	NSD	40	01	30 N.
	NSD	74	03	10 W.
	NSD	38	55	53 N.
	NSD	74	54	35 W.
	NSD	38	47	35 N.
	NSD	75	05	26 W.
	NSD	38	32	45 N.
	NSD	75	03	22 W.

Name of station.	Call letters.	Position.
<i>Atlantic coast—Continued.</i>		
Hog Island, Va.....	NCZ	37 22 36 N. 75 42 37 W.
Virginia Beach, Va.....	NCZ	36 51 10 N. 75 58 33 W.
Poyner's Hill, N. C.....	NCZ	36 17 16 N. 75 47 48 W.
Cape Hatteras, N. C.....	NDW	35 14 22 N. 75 31 42 W.
Cape Lookout, N. C.....	NAN	34 36 11 N. 76 32 18 W.
North Island, S. C.....	NZW	33 13 21 N. 79 11 06 W.
Folly Island, S. C.....	NZV	32 41 00 N. 79 53 14 W.
Jupiter, Fla. ¹	NAQ	26 56 59 N. 80 04 57 W.
Key West, Fla. ¹	NAR	24 33 08 N. 81 45 18 W.
<i>Gulf coast.</i>		
Pass a Loutre, La.....	NBX	29 11 24 N. 89 02 26 W.
Burwood, La.....	NBX	28 57 27 N. 89 23 10 W.
Grand Island, La.....	NLI	29 13 52 N. 89 59 46 W.
<i>Pacific coast.</i>		
Cattle Point, Wash. ¹	NFN	48 27 04 N. 122 57 45 W.
Smith Island, Wash. ¹	NFH	48 19 05 N. 122 50 39 W.
New Dungeness, Wash. ¹	NFT	48 10 36 N. 123 07 51 W.
Port Angeles, Wash. ¹	NFT	48 08 30 N. 123 24 19 W.
Tatoosh, Wash.....	NFD	48 23 41 N. 124 44 13 W.
Ocean Park, Wash. ¹	NPE	46 27 53 N. 124 03 16 W.
Fort Stevens, Oreg.....	NPE	46 11 32 N. 123 59 15 W.
Empire, Oreg. ¹	NPF	43 23 03 N. 124 18 58 W.
Eureka, Calif.....	NPW	40 41 48 N. 124 16 34 W.
Point Reyes, Calif.....	NLG	38 02 13 N. 122 59 36 W.
Bird Island, Calif.....	NLD	37 49 27 N. 122 32 12 W.
Point Montara, Calif.....	NLH	37 32 02 N. 122 31 07 W.
Farallon Island, Calif.....	NPI	37 41 58 N. 122 59 56 W.
Point Arguello, Calif.....	NPK	34 34 43 N. 120 38 51 W.
Point Hueneme, Calif.....	NMD	34 08 43 N. 119 12 30 W.
Point Fermin, Calif.....	NPX	33 42 19 N. 118 17 38 W.
Point Loma, Calif.....	NPL	32 42 21 N. 117 15 17 W.
Imperial Beach, Calif.....	NPL	32 35 14 N. 117 07 54 W.

¹ Out of commission at present. Notice will be given when operation is resumed.

NOTE.—These instructions embody the latest information on United States naval radio compass stations and cancel all previous instructions issued.—Submitted by Naval Communication Service.

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ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, April 1, 1922—No. 60

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name	=Name of station.
G. loc.	=Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call	=Call letters assigned.
System	=Radio system used and sparks per second.
Range	=Normal range in nautical miles.
W. l.	=Wave lengths assigned: Normal wave lengths in italics.
Service	=Nature of service maintained: PG=General public. PR=Limited public. P=Private. O=Government business exclusively.
Hours	=Hours of operation. N=Continuous service. X=No regular hours. m=a. m. (12 m=midday). s=p. m. (12s=midnight).
Rates	=Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co.	=Independent Wireless Telegraph Co.
R. C. of A.	=Radio Corporation of America.
S. O. R. S.	=Ship Owners' Radio Service.
Co.	=Company.
Corp.	=Corporation.
&	=And.
Do.	=Ditto.
C. w.	=Continuous wave.
V. t.	=Vacuum tube.
FX.	=Fixed station.

CERTIFICATE: By direction of the Secretary of Commerce this publication is issued as an administrative report and is required for the proper transmission of the public business.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Albany, N. Y. ¹	WNJ	360	PR (FX)		Shotton Radio Manufacturing Co.
Altadena, Calif. ²	KGO	360	PR (FX)		Altadena Radio Laboratory.
Atlanta, Ga.	WGM	360, 485.	PR (FX)		Atlanta Constitution.
Do.	WSB	360, 485.	PR (FX)		Atlanta Journal.
Austin, Tex. ³	WCM	360, 485.	PR (FX)	X	University of Texas.
Balabac, P. I.	KEW				Philippine Insular Government.
Baltimore, Md. ⁴	WKC	360	PR (FX)		Joseph M. Zamoiski Co.
Barneget, N. J.	WCI	300, 600, 16, 800.	PR (FX)	N	R. C. of A.
(Tuckerton). ⁵					
Bay City, Mich. ⁶	WTP	360	PR (FX)		George M. McBride.
Birmingham, Ala. ⁷	WSY	360	PR (FX)		Alabama Power Co.
Bongao, P. I.	KEO				Philippine Insular Government.
Berkeley, Calif. ⁸	KRE	360	PR (FX)	X	Maxwell Electric Co.
Buffalo, N. Y. ⁹	WGR	360, 485.	PR (FX)		Federal Telephone & Telegraph Co.
Do. ¹⁰	WWT	360	PR (FX)		McCarthy Bros. & Ford.
Cagayan de Sulu, P. I.	KEV				Philippine Insular Government.
Camden, N. J. ¹¹	WRP	360	PR (FX)		Federal Institute of Radio Telegraphy.
Canton, Ohio ¹²	WBB	360	PR (FX)	X	Daily News Printing Co.
Charlotte, N. C. ¹³	WBT	360	PR (FX)		Southern Radio Corp.
Chicago, Ill. ¹⁴	WGU	360	PR (FX)	X	The Fair.
Chignik, Alaska ¹⁵	KNP	300, 525, 600, 1650.	PR (FX)	X	Columbia River Packers' Association.
Cincinnati, Ohio ¹⁶	WLW	360	PR (FX)	X	Crosley Manufacturing Co.
Dearborn, Mich. ¹⁷	WWI	360	PR (FX)	X	Ford Motor Co.
Denver, Colo. ¹⁸	KLZ	360, 485.	PR (FX)	X	Reynolds Radio Co.
Do. ¹⁹	KOA	485.	PR (FX)	X	Young Men's Christian Association.
Des Moines, Iowa.	WGF	360	PR (FX)		The Register and Tribune.
Do.	WHX	360	PR (FX)		Iowa Radio Corporation.
Detroit, Mich. ²⁰	KOP	360	PR (FX)		Detroit Police Department.
Eldorado, Kans. ²¹	WAH	440, 485.	PR (FX)		Midland Refining Co.
Erie, Pa. ²²	WJT	360	PR (FX)		Electric Equipment Co.
Do. ²³	WSX	360	PR (FX)		Erie Radio Co.

¹ Loc. 0.73° 45' 00", N. 42° 39' 00"; range, 75; system, composite (v. t. telephone); hours, 7.30-9.45 p. m.; rates, none.

² Loc. 0.118° 07' 37", N. 34° 11' 34"; range, 25; system, composite (v. t. telephone); hours, 1-2 and 6-7 p. m.; rates, none.

³ Loc. 0.97° 44' 10", N. 30° 17' 00"; range, 300; system, De Forest (v. t. telephone and telegraph) and composite, spark 480; rates, none.

⁴ Range, 50; system, composite (v. t. telephone); hours, 7.30-8.30 p. m. on Tuesday, Thursday, and Saturday; rates, none.

⁵ Loc. (approximately) 0.74° 23' 00", N. 39° 33' 00"; system, Alexanderson alternator; rates to Germany, 25 c. per word.

⁶ Range, 50; system, De Forest (v. t. telephone); hours, 12 m.-1.30 p. m., 6-7 p. m., and 10.30-12 p. m.; rates, none.

⁷ Loc. 0.66° 49' 00", N. 33° 30' 00"; range, 100; system, composite (v. t. telephone); hours, 7-10 p. m.; rates, none.

⁸ Range, 50; system, composite (v. t. telephone); rates, none.

⁹ Loc. (approximately) 0.78° 53' 00", N. 42° 53' 00"; range, 100; system, composite (v. t. telephone); hours, 10 a. m.-10 p. m. intermittently; rates, none.

¹⁰ Range, 30; system, composite (v. t. telephone); hours, 3.30-5 and 7-8.30 p. m.; rates, none.

¹¹ Loc. 0.74° 07' 24", N. 39° 58' 30"; system, composite (v. t. telephone); hours, 1-4 and 7.30-9.30 p. m.; rates, none.

¹² Loc. 0.81° 23' 16", N. 40° 45' 01"; range, 100; system, composite (v. t. telephone); rates, none.

¹³ Loc. (approximately) 0.80° 51' 00", N. 35° 13' 00"; range, 100; system, composite (v. t. telephone); hours, 10-11.45 a. m. and 7.30-9.45 p. m.; rates, none.

¹⁴ Loc. (approximately) 0.87° 37' 00", N. 41° 53' 00"; range, 100; system, De Forest (v. t. telephone); rates, none.

¹⁵ Loc. (approximately) 0.158° 23' 00", N. 39° 45' 00"; range, 300; system, composite, 240; rates, none.

¹⁶ Loc. (approximately) 0.84° 30' 00", N. 39° 06' 00"; system, composite (v. t. telephone); rates, none.

¹⁷ Loc. (approximately) 0.63° 14' 00", N. 42° 18' 00"; range, 150; system, composite (v. t. telephone); rates, none.

¹⁸ Loc. (approximately) 0.105° 00' 00", N. 39° 43' 00"; range, 20; system, composite (v. t. telephone); rates, none.

¹⁹ Loc. (approximately) 0.105° 00' 00", N. 39° 45' 00"; range, 100; system, composite, 1,000; rates, none.

²⁰ Range, 100; system, composite (v. t. telephone); hours, 3-11 p. m.; rates, none.

²¹ Range, 200; system, composite (v. t. telephone and telegraph); hours, 8 a. m.-5.30 p. m.; rates, none.

²² Loc. (approximately) 0.80° 05' 00", N. 42° 07' 00"; system, De Forest (v. t. telephone); hours, 7.30-9.30 p. m. Monday, Wednesday, and Friday; rates, none.

²³ Loc. (approximately) 0.80° 08' 00", N. 42° 08' 40"; range, 50; system, composite (v. t. telephone); hours, 12.15-1.30 and 10-11 p. m.; rates, none.

Commercial land stations, alphabetically by names of stations—Continued.

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Fort Morgan, Ala. ²⁵	WIO	300, 450, 600, 1700.	PR(FX)	X	Tropical Radio Telegraph Co.
Fort Worth, Tex. ²⁵	WCV	440.	PR(FX)		Midland Refining Co.
Do. ²⁵	WPA	360.	PR(FX)	X	Fort Worth Record.
Fresno, Calif. ²⁵	KMJ	360.	PR(FX)		San Joaquin Light & Power Corporation.
Honolulu, Hawaii. ²⁵	KGU	360.	PR(FX)		Marion A. Mulrony.
Houston, Tex. ²⁵	WEV	360, 485.	PR(FX)	X	Hurlburt-Still Electrical Co.
Idaho, Wash. ²⁵	KGY	360.	PR(FX)		St. Martins College (Rev. S. Ruth)
Little Rock, Ark. ²⁵	WSV	360.	PR(FX)		L. M. Hunter and G. L. Carrington.
Los Angeles, Calif. ²⁵	KHJ	360.	PR(FX)		C. R. Kierulff & Co.
Do. ²⁵	KJS	360.	PR(FX)	X	Bible Institute of Los Angeles.
Mari, P. I.	KPZ				Philippine Insular Government.
McKeesport, Pa. ²⁵	WIK	360.	PR(FX)		K. & L. Electric Co.
Memphis, Tenn. ²⁵	WKN	360, 485.	PR(FX)	X	Reichman-Crosby Co.
Do. ²⁵	WPO	360.	PR(FX)		United Equipment Co.
Monterey, Calif. ²⁵	KLN	360.	PR(FX)		Noggle Electric Works.
Morgantown, W. Va. ²⁵	WHD	360.	PR(FX)		West Virginia University.
Newark, N. J. ²⁵	WBS	360.	PR(FX)	X	D. W. May.
New Lebanon, Ohio. ²⁵	WPG	360.	PR(FX)		Nushawg Poultry Farm.
New Orleans, La. ²⁵	WGV	360.	PR(FX)		Interstate Electric Co.
Do. ²⁵	WWL	360.	PR(FX)	X	Loyola University.
New York, N. Y. ²⁵	WWZ	360.	PR(FX)		John Wanamaker.
Norfolk, Nebr. ²⁵	WKH	440.	PR(FX)		Midland Refining Co.
Oakland, Calif. ²⁵	KLS	360.	PR(FX)	X	Warner Brothers.
Oklahoma City, Okla. ²⁵	WKY	360, 485.	PR(FX)		Oklahoma Radio Shop.
Omaha, Nebr. ²⁵	WDV	360.	PR(FX)		John O. Yeiser, Jr.
Paris, Tex. ²⁵	WTK	360.	PR(FX)		Paris Radio Electric Co.
Philadelphia, Pa. ²⁵	WFI	360.	PR(FX)		Strawbridge & Clothier.
Do. ²⁵	WIP	360.	PR(FX)		Gimbel Brothers.
Do. ²⁵	WOO	360.	PR(FX)		John Wanamaker.
Portland, Oreg. ²⁵	KGG	360.	PR(FX)		Hallock & Watson Radio Service.

²⁵ Loc. (approximately) 0.87° 00' 00", N. 32° 00' 00"; range, 100; system, U. S. Signal Corps, 1,000; rates, ship service, 12c. per word; limited public service to Mobile, Burwood, and New Orleans, 10c. per word.

²⁶ Range, 150; system, composite (v. t. telephone and telegraph); hours, 8 a. m.-5.30 p. m.; rates, none.

²⁷ Loc. (approximately) 0.97° 20' 00", N. 32° 44' 00"; range, 100; system, composite (v. t. telephone); rates, none.

²⁸ Range, 150; system, composite (v. t. telephone); hours, 5-6 p. m. Sunday and 7-8 p. m. Tuesday and Friday; rates, none.

²⁹ Range, 50; system, composite (v. t. telephone); hours, 8-9 p. m.; rates, none.

³⁰ System, composite (v. t. telephone and telegraph), also composite spark, 240; rates, none.

³¹ Loc. 0.122° 47' 59", N. 47° 30' 00"; range, 25; system, composite (v. t. telephone); hours, 8.30-9.30 p. m. Sunday, Tuesday, and Friday; rates, none.

³² Range, 150; system, composite (v. t. telephone); hours, 7-10 p. m.; rates, none.

³³ Loc. (approximately) 0.118° 14' 30", N. 34° 03' 00"; range, 150; system, composite (v. t. telephone); hours, 9-10 a. m. and 12.30-1.30, 3-5, and 7-9 p. m.; rates, none.

³⁴ Range, 60; system, composite (v. t. telephone); rates, none.

³⁵ Loc. (approximately) 0.79° 50' 00", N. 40° 35' 00"; range, 50; system, composite (v. t. telephone); hours, 6.30-7 p. m. daily; 1.30-2.30 p. m. Sunday and 9.30-10.30 p. m. Tuesday and Thursday; rates, none.

³⁶ Range 50; system, R. C. of A. (v. t. telephone); rates, none.

³⁷ Loc. (approximately) 0.90° 03' 00", N. 35° 09' 00"; range, 200; system, composite (v. t. telephone); hours, 7-9.30 p. m.; rates, none.

³⁸ Range, 50; system, composite (v. t. telephone); hours, 7 a. m.-9 p. m.; rates, none.

³⁹ System, composite (v. t. telephone); hours, 4-6 and 7.30 p. m. daily; 10.45 a. m.-12 m. Sundays; rates, none.

⁴⁰ Loc. 0.74° 10' 08", N. 40° 44' 15"; range, 30; system, De Forest (v. t. telephone); rates, none.

⁴¹ Range, 150; system, composite (v. t. telephone); hours, 1-3 and 7.30-9.45 p. m.; rates, none.

⁴² Range, 100; system, composite (v. t. telephone and telegraph); hours, 11 a. m.-12 m. and 7-10 p. m.; rates, none.

⁴³ Loc. 0.90° 07' 12", N. 29° 56' 54"; range, 100; system, composite (v. t. telephone); rates, none.

⁴⁴ Rates, none.

⁴⁵ Range, 200; system, composite (v. t. telephone and telegraph); hours, 8 a. m.-5.30 p. m.; rates, none.

⁴⁶ Range, 20; system, composite (v. t. telephone and telegraph); rates, none.

⁴⁷ Loc. 0.97° 30' 00", N. 35° 30' 15"; range, 100; system, composite (v. t. telephone); hours, 12-1 and 7.30-9.30 p. m. daily and 3-4; 7.30-9.30 p. m. Sunday; rates, none.

⁴⁸ Range, 100; system, composite (v. t. telephone); hours, 7.30-9.30 p. m.; rates, none.

⁴⁹ Loc. 0.95° 35' 00", N. 33° 40' 00"; range, 150; system, composite (v. t. telephone); hours, 10 a. m.-5 p. m. and 7-10 p. m.; rates, none.

⁵⁰ Range, 50; system, composite (v. t. telephone); hours, 7.30-9.30 p. m.; rates, none.

⁵¹ Loc. 0.75° 09' 44", N. 39° 57' 06"; range, 100; system, composite (v. t. telephone); hours, 12 m.-1 p. m. and 7-8 p. m. Monday, Wednesday, and Saturdays; rates, none.

⁵² Loc. 0.75° 09' 44", N. 39° 57' 06"; system, De Forest (v. t. telephone); hours, 1-5 and 7-10 p. m.; rates, none.

⁵³ Loc. 0.122° 45' 00", N. 45° 30' 00"; range, 100; system, composite (v. t. telephone); hours 4-10 p. m.; rates, none.

Commercial land stations, alphabetically by names of stations—Continued.

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Portland, Oreg. ⁵³	KGN	360.....	PR(FX)	.....	Northwestern Radio Mfg. Co.
Do. ⁵⁴	KGW	360.....	PR(FX)	.....	Oregonian Publishing Co.
Do. ⁵⁵	KQY	360.....	PR(FX)	.....	Stubbs Electric Co.
Do. ⁵⁶	KYG	360.....	PR(FX)	.....	Willard P. Hawley, jr.
Reedley, Calif. ⁵⁷	KMC	360.....	PR(FX)	.....	Lindsay-Weatherill & Co.
Ridgewood, N. Y. ⁵⁸	WHN	360.....	PR(FX)	.....	Ridgewood Times Printing & Publishing Co.
Rockland, Me. ⁵⁹	WME	300, 425, 600.....	PR(FX)	X	Swans Island & Rockland Radio Communication Service.
San Francisco, Calif. ⁶⁰	KSL	360.....	PR(FX)	X	The Emporium.
Schenectady, N. Y. ⁶¹	WRL	360.....	PR(FX)	X	Union College.
Seattle, Wash. ⁶²	KJR	360, 485.....	PR(FX)	X	Vincent I. Kraft.
Slasi, P. I.	KED	.....	.....	.....	Philippine Insular Government.
Spokane, Wash. ⁶³	KFZ	360.....	PR(FX)	.....	Doerr-Mitchell Electric Co.
St. Louis, Mo. ⁶⁴	KSD	360.....	PR(FX)	.....	Post Dispatch.
Do. ⁶⁵	WEW	485.....	PR(FX)	X	St. Louis University.
Swans Island, Me. ⁶⁶	WTI	300, 425, 600.....	PR(FX)	X	Swans Island & Rockland Radio Communication Service.
Tacoma, Wash. ⁶⁷	KMO	360.....	PR(FX)	.....	Love Electric Co.
Tarrytown, N. Y. ⁶⁸	WRW	360.....	PR(FX)	.....	Tarrytown Radio Research Lab.
Tulsa, Okla. ⁶⁹	WEH	440, 485.....	PR(FX)	.....	Midland Refining Co.
Urbana, Ill. ⁷⁰	WRM	360, 410.....	PR(FX)	.....	University of Illinois.
Utica, N. Y. ⁷¹	WSL	360.....	PR(FX)	.....	J. & M. Electric Co.
Washington, D. C. ⁷²	WIL	360.....	PR(FX)	.....	Continental Electrical Supply Co.
Do. ⁷³	WMU	360.....	PR(FX)	.....	Douglas-Hill Electric Co.
Do. ⁷⁴	WPM	360.....	PR(FX)	.....	Thomas J. Williams.
Wichita, Kans. ⁷⁵	WEY	360, 485.....	PR(FX)	X	Cosradio Co.
Worcester, Mass. ⁷⁶	WCN	360, 485.....	PR(FX)	.....	Clark University.
Yakima, Wash. ⁷⁷	KFV	360.....	PR(FX)	.....	Foster-Bradbury Radio Store.
Do. ⁷⁸	KQT	360.....	PR(FX)	.....	Electric Power & Appliance Co.
Youngstown, Ohio ⁷⁹	WMC	360.....	PR(FX)	.....	Columbia Radio Co.

⁵³ Loc. 0.122° 38' 46", N. 45° 30' 54", range, 150; system, composite (v. t. telephone); hours 4-6 and 7-10 p. m.; rates, none.

⁵⁴ Range, 100; system, composite (v. t. telephone); hours, 1-5 p. m. and 7.30-9.30 p. m.; rates, none.

⁵⁵ Loc. (approximately) 0.122° 45' 00", N. 45° 30' 00"; range, 50; system, Westinghouse (v. t. telephone); hours, 7.30-9.30 p. m.; rates, none.

⁵⁶ Loc. 0.122° 40' 44", N. 45° 31' 39"; range, 100; system, composite (v. t. telephone); hours, 4.30-5.30 and 7-10 p. m.; rates, none.

⁵⁷ Range, 50; system, composite (v. t. telephone); hours, 8-9 p. m.; rates, none.

⁵⁸ Range, 30; system, composite (v. t. telephone); hours, 7.30-9.30 p. m.; rates, none.

⁵⁹ Loc. (approximately) 0.69° 07' 00", N. 44° 07' 30"; range, 300; system, Wireless Specialty Apparatus Co., 1,000; rates, to Swans Island, Me., 3 c. per word.

⁶⁰ Range, 50; system, composite (v. t. telephone); rates, none.

⁶¹ Loc. 0.73° 55' 42", N. 42° 49' 00"; range, 200; system, composite (v. t. telephone); rates, none.

⁶² Loc. 0.122° 18' 24", N. 47° 40' 43"; range, 23; system, composite (v. t. telephone); rates, none.

⁶³ Loc. (approximately) 0.117° 25' 00", N. 47° 40' 00"; system, composite (v. t. telephone); hours, 7-10 p. m.; rates, none.

⁶⁴ Loc. 0.90° 12' 17", N. 38° 38' 03"; range, 100; system, De Forest (v. t. telephone); hours, 10 a. m.-10 p. m. intermittently; rates, none.

⁶⁵ Loc. 0.90° 13' 58", N. 38° 38' 17"; range, 150; system, composite (v. t. telephone) and composite spark, 583; rates, none.

⁶⁶ Loc. (approximately) 0.68° 27' 00", N. 44° 10' 00"; range, 100; system, Wireless Specialty Apparatus Co., 1,000; rates, to Rockland, Me. 3 c. per word.

⁶⁷ Loc. 0.122° 27' 54", N. 47° 15' 48"; range, 50; system, composite (v. t. telephone); hours, 7-10 p. m.; rates, none.

⁶⁸ Loc. 0.73° 51' 30", N. 41° 01' 40"; system, composite (v. t. telephone); hours, 9 a. m.-12 p. m.; rates, none.

⁶⁹ Loc. (approximately) 0.51° 20' 00", N. 35° 20' 00"; range, 150; system, composite (v. t. telephone and telegraph); hours, 8 a. m.-5.30 p. m.; rates, none.

⁷⁰ Loc. (approximately) 0.88° 15' 00", N. 40° 07' 00"; range, 100; system, composite (v. t. telephone and telegraph) and composite spark, 360; hours, 7-10 p. m.; rates, none.

⁷¹ System, De Forest (v. t. telephone); hours, 10 a. m.-6 p. m.; rates, none.

⁷² System, composite (v. t. telephone); hours, 7.30-9.30 p. m. Monday and Wednesday; rates, none.

⁷³ System, composite (v. t. telephone); hours, 4.30-5.30 p. m. Monday, Wednesday, and Friday; rates, none.

⁷⁴ Range, 75; system, composite (v. t. telephone); hours, 12-1 p. m. and 7.30-9.30 p. m., Monday; rates, none.

⁷⁵ Loc. (approximately) 0.96° 08' 00", N. 32° 30' 00"; range, 150; system, composite (v. t. telephone) and composite spark, 650; rates, none.

⁷⁶ Loc. 0.71° 49' 35", N. 42° 14' 53"; range, 150; system, composite (v. t. telephone and telegraph); hours, 7.30-9.30 p. m.; rates, none.

⁷⁷ Loc. (approximately) 0.126° 36' 00", N. 40° 30' 00"; range, 150; system, composite (v. t. telephone); hours, 12 m.-10 p. m.; rates, none.

⁷⁸ Loc. (approximately) 0.120° 30' 00", N. 47° 30' 00"; range, 50; system, De Forest (v. t. telephone); hours 10 a. m.-10 p. m.; rates, none.

⁷⁹ Range, 150; system, composite (v. t. telephone); hours 8.30-9.45 p. m.; rates, none.

NOTE.—Stations having a wave length of 360 meters transmit news, concerts, etc., and those having a wave length of 485 meters transmit market and weather reports.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
Daniel Kern.....	KDXG	<i>Cents.</i>	<i>Cents.</i>	PG	X	Independent Towing Co.	R. C. of A. Owner of vessel.
Hera ¹	KDGA	8	8	PG	X	Standard Oil Co. of N. J.	
Jacob Luckenbach.....	KDXE			PG	X	Luckenbach S. S. Co.	
La Jota ²	KDXF			P	X	W. W. Wilson.....	
Mandarin.....	KDXD			PG	X	Dollar S. S. Line.....	

¹ Range, 150; system, Telefunken, 1,000; w. l., 300, 450, 800.

² System, composite (c. w.-v. t.); w. l., 300, 450, 800; rates, none.

Commercial land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.		
KDGA	Hera.....	b	WEY	Wichita, Kans.....	c
KDXD	Mandarin.....	b	WFI	Philadelphia, Pa.....	c
KDXE	Jacob Luckenbach.....	b	WGF	Des Moines, Iowa.....	c
KDXF	La Jota.....	b	WGM	Atlanta, Ga.....	c
KDXG	Daniel Kern.....	b	WGR	Buffalo, N. Y.....	c
KED	Siasi, P. I.....	c	WGU	Chicago, Ill.....	c
KEO	Bongao, P. I.....	c	WGV	New Orleans, La.....	c
KEV	Cagayan de Sulu, P. I.....	c	WHD	Morgantown, W. Va.....	c
KEW	Balabac, P. I.....	c	WHN	Ridgewood, N. Y.....	c
KFV	Yakima, Wash.....	c	WHX	Des Moines, Iowa.....	c
KFZ	Spokane, Wash.....	c	WIK	McKeesport, Pa.....	c
KGG	Portland, Oreg.....	c	WIL	Washington, D. C.....	c
KGN	Portland, Oreg.....	c	WIO	Fort Morgan, Ala.....	c
KGO	Altadena, Calif.....	c	WIP	Philadelphia, Pa.....	c
KGU	Honolulu, Hawaii.....	c	WJT	Erie, Pa.....	c
KGW	Portland, Oreg.....	c	WKC	Baltimore, Md.....	c
KGY	Lacey, Wash.....	c	WKH	Norfolk, Nebr.....	c
KHJ	Los Angeles, Calif.....	c	WKN	Memphis, Tenn.....	c
KJR	Seattle, Wash.....	c	WKY	Oklahoma City, Okla.....	c
KJS	Los Angeles, Calif.....	c	WLW	Cincinnati, Ohio.....	c
KLN	Monterey, Calif.....	c	WMC	Youngstown, Ohio.....	c
KLS	Oakland, Calif.....	c	WME	Rockland, Me.....	c
KLZ	Denver, Colo.....	c	WMU	Washington, D. C.....	c
KMC	Reedley, Calif.....	c	WNJ	Albany, N. Y.....	c
KMJ	Fresno, Calif.....	c	WOO	Philadelphia, Pa.....	c
KMO	Tacoma, Wash.....	c	WPA	Fort Worth, Tex.....	c
KNP	Chignik, Alaska.....	c	WPG	New Lebanon, Ohio.....	c
KOA	Denver, Colo.....	c	WPM	Washington, D. C.....	c
KOP	Detroit, Mich.....	c	WPO	Memphis, Tenn.....	c
KPZ	Mati, P. I.....	c	WRL	Schenectady, N. Y.....	c
KQT	Yakima, Wash.....	c	WRM	Urbana, Ill.....	c
KQY	Portland, Oreg.....	c	WRP	Camden, N. J.....	c
KRE	Berkeley, Calif.....	c	WRW	Tarrytown, N. Y.....	c
KSD	St. Louis, Mo.....	c	WSB	Atlanta, Ga.....	c
KSL	San Francisco, Calif.....	c	WSI	Utica, N. Y.....	c
KYG	Portland, Oreg.....	c	WSV	Little Rock, Ark.....	c
WAH	El Dorado, Kans.....	c	WSX	Erie, Pa.....	c
WBS	Newark, N. J.....	c	WSY	Birmingham, Ala.....	c
WBT	Charlotte, N. C.....	c	WTI	Swans Island, Me.....	c
WCI	Barneget, N. J. (Tuckerton).....	c	WTK	Paris, Tex.....	c
WCM	Austin, Tex.....	c	WTP	Bay City, Mich.....	c
WCN	Worcester, Mass.....	c	WWB	Canton, Ohio.....	c
WCV	Fort Worth, Tex.....	c	WWI	Dearborn, Mich.....	c
WDV	Omaha, Nebr.....	c	WWL	New Orleans, La.....	c
WEH	Tulsa, Okla.....	c	WWT	Buffalo, N. Y.....	c
WEV	Houston, Tex.....	c	WWZ	New York, N. Y.....	c
WEW	St. Louis, Mo.....	c			

Government land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berns bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Boston, Mass. ¹	NAD	600, 975, 1620, 1950, 5000.	O	N	U. S. Navy.
Chicago, Ill.	WVT		O	X	U. S. Army.
Fort Omaha, Nebr.	WVU		O	X	U. S. Army.
Governors Island, N. Y.	WVP		O	X	U. S. Army.
Shanghai, China. ²	NPJ	300, 600, variable.	O	X	U. S. Navy.

¹ Loc. 0.71° 03' 01" N. 42° 23' 26", system, U. S. Navy.

² Loc. 0.121° 29' 00" E, N. 31° 15' 00", range, 100; system, U. S. Navy (receiving station only).

Government land and ship stations, alphabetically by call signals.

[b—ship station; c—land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NAD	Boston, Mass. ....c	WVT	Chicago, Ill. ....c
NPJ	Shanghai, China. ....c	WVU	Fort Omaha, Nebr. ....c
WVP	Governors Island, N. Y.c		

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921.]

Station.	Call signal.	Wave lengths.	Station controlled by—
Amarillo, Tex.	5ZH	200, 375.	J. Laurance Martin, 605 East Fourth Street.
Atlanta, Ga.	4XA	Variable 200 to 1000.	Emory University.
Austin, Tex.	5XX	Variable.	Tom L. Gray, 3908 Avenue F.
Bakersfield, Calif.	6ZS	200, 375.	Lindley Winsor, 200 Twenty-second Street.
Bangor, Me.	1XG	Variable 200 to 500.	Bangor Railway & Electric Co., Graham Building.
Berkeley, Calif.	6ZQ	200, 375.	Fred L. Wismer, 1906 Chestnut Street.
Brownwood, Tex.	5XF	200, 375, variable.	Howard Payne College.
Buffalo, N. Y.	8ZM	200, 375.	Cyrus H. Fraser, 48 Glenwood Avenue.
Chicago, Ill.	9XB	200, 375.	City of Chicago, Room 614, City Hall.
Colorado Springs, Colo.	9XC	200, 375.	Colorado College.
Columbus, Ohio.	8XJ	200, 375.	Ohio State University.
Do.	8ZO	200, 375.	Loren G. Windom, 1375 Franklin Avenue.
Dallas, Tex.	5ZAQ	200, 375.	City of Dallas, Police and Fire Signal Department.
Ellsworth, Me.	1XC	Variable, 200 to 500.	Bangor Railway & Electric Co., Graham Building, Bangor, Me.
El Paso, Tex.	5ZAR	200, 375.	Elite Electric Shop, 407 Mesa Avenue.
Fort Worth, Tex.	5YS	200, 375.	Oba R. Garrett, 6114 Main Street.
Houston, Tex.	5XN	200, 375.	Ernest Hubner, 1607 McKee Street.
Knoxville, Tenn.	5XO	Variable, 200 to 375.	Philip Stout, 162 Riverside Drive.
Lansing, Mich.	8XM	700.	Maurice H. Pancost, 1101 Citimax Street.
Mayville, N. Dak.	9YF	200, 375.	State Normal School.
Mount Carroll, Ill.	9ZG	200, 375.	Albert C. Mertz.
New Orleans, La.	5XM	200, 375.	Electron Engineering Co., 1115 Whitney Central Building.
Do.	5YR	200, 375.	Loyola University.
New York, N. Y.	2XM	Variable.	Columbia University.
Do.	2XY	Variable.	American Telephone and Telegraph Co., 24 Walker Street.
Pasadena, Calif.	6XI	200, 375, variable.	Samuel G. McMeen, 683 South Los Robles Avenue.
Polytechnic, Mont.	7YI	200, 375.	Billings Polytechnic Institute.
Portland, Oreg.	7XI	200, 375, variable.	Hallock & Watson Radio Service, 192 Park Street.
San Marcos, Tex.	5YT	200, 375.	San Marcos High School.
Washington, Pa.	8XG	200, 375.	Washington and Jefferson College.

Special land stations, grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
1XC	First district:	6XI	Sixth district:
1XG	Ellsworth, Me.	6ZQ	Pasadena, Calif.
2XM	Bangor, Me.	6ZS	Berkeley, Calif.
2XY	Second district:	7XI	Bakersfield, Calif.
4XA	New York, N. Y.	7YI	Seventh district:
5XF	Do.	8XG	Portland, Oreg.
5XM	Fourth district:	8XJ	Polytechnic, Mont.
5XN	Atlanta, Ga.	8XM	Eight district:
5XO	Fifth district:	8ZM	Washington, Pa.
5XX	Brownwood, Tex.	8ZO	Columbus, Ohio.
5YR	New Orleans, La.	9XB	Lansing, Mich.
5YS	Houston, Tex.	9XC	Buffalo, N. Y.
5YT	Knoxville, Tenn.	9YF	Columbus, Ohio.
5ZAQ	Austin, Tex.	9ZG	Ninth district:
5ZAR	New Orleans, La.		Chicago, Ill.
5ZH	Fort Worth, Tex.		Colorado Springs, Colo.
	San Marcos, Tex.		Mayville, N. Dak.
	Dallas, Tex.		Mount Carroll, Ill.
	El Paso, Tex.		
	Amarillo, Tex.		

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS.

BOLINAS, CALIF. (KET).—Loc. $0.122^{\circ} 40' 45''$, N. $37^{\circ} 54' 30''$; system, R. C. of A. alternator; w. l., 13,310; rates, from Bolinas or San Francisco, Calif., to Kahuku or any point on the island of Oahu, Hawaii, 25 c. per word; Government rate, $12\frac{1}{2}$ c. per word; press rate, 5 c. per word; lettergrams, \$1.50 for the first 12 words and 10 c. each additional word; week-end lettergrams, \$2.50 for the first 24 words and 8 c. for each additional word. From Bolinas or San Francisco, Calif., to Japan, 72 c. per word; Government rate 36 c. per word; press rate, 27 c. per word; urgent rate, \$2.16 per word.

CAPE MAY, N. J.—W. l., 300, 600, 1610 (1610 meters used for limited commercial service between stations of the R. C. of A.).

CHARLESTON, W. VA.—Strike out all particulars.

CHICAGO, ILL. (KYW).—System, Westinghouse (v. t. telephone and telegraph); W. l., 360, 485; hours, X.

CLEVELAND, OHIO (WHK).—Hours, 1.30–2. 3.30–4, and 8–9.30 p. m.

CORAM HILL, N. Y.—W. l., 19,000.

DALLAS, TEX. (WRR).—System, composite (v. t. telephone); w. l., 360, 485.

DETROIT, MICH. (WBL).—Call signal changed to WWJ.

EASTHAMPTON, N. Y.—Rates, effective April 1; all ship traffic, 10 c. per word.

EDWIGHT, W. VA.—Strike out all particulars.

LOS ANGELES, CALIF. (KYJ).—W. l., 360, 485; hours 4–5 and 7.45–9 p. m.

LOS ANGELES, CALIF. (KZC).—Call signal changed to KOG.

MARION, MASS. (WCC).—W. l., 300, 600, 2800 (2800 meters used for limited commercial service between stations of the R. C. of A.).

NEW BRUNSWICK, N. J.—Range, 4,000.

NEW LONDON, CONN. (WLC).—Loc. $0.72^{\circ} 05' 02''$, N. $41^{\circ} 18' 01''$; range, 400; system, R. C. of A., 120; w. l., 300, 450, 600; hours, 7 a. m.–11 p. m.; rates, ship service, 10 c. per word; station operated and controlled by R. C. of A.

NEW YORK, N. Y. (WSE).—Rates, effective April 1, all ship traffic, 10 c. per word.

OMAHA, NEBR.—Station operated and controlled by Metropolitan Utilities District.

ROCHESTER, N. Y.—Range, 100.

SAN DIEGO, CALIF.—System, composite (v. t. telephone); w. l., 360; hours, 7.30–9 p. m.

SAN FRANCISCO, CALIF. (KDN).—W. 1., 360, 485.

SAN FRANCISCO, CALIF. (KGB).—Strike out all particulars.

SAN FRANCISCO, CALIF. (KUO).—Hours, X.

SIASCONSET, MASS.—W. 1., 300, 600, 1610 (1610 meters used for limited commercial service between stations of the R. C. of A.).

TOLEDO, OHIO (WDZ).—Strike out all particulars.

TUCKERTON, N. Y.—W. 1., 15,900; rates, to France, 14 c. per word.

WASHINGTON, D. C. (WDM).—Hours, 10 a. m.—12.30 p. m. and 7–9.30 p. m.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ABRON.—System, Navy-R. C. of A., 1000; w. 1., 300, 450, 600; hours, X.

ADMIRAL RODMAN.—System, R. C. of A., 1000.

AGWIBAY.—Range, 200; system, I. W. T. Co., 1000; w. 1., 300, 600; hours, X.

AJAX.—Strike out all particulars.

ALA.—Station operated and controlled by S. O. R. S.

ALASKAN.—Range, 300; w. 1., 300, 450, 600; rates, North and South American and transoceanic services, 8 c. per word.

ALLIANCA.—Hours, X; rates, North and South American service, 4 c. per word.

ALLOWAY.—System, Navy, 1000; w. 1., 300, 450, 600; hours, X.

AMPETCO.—Strike out all particulars.

ANACORTES.—System, Navy-Kilbourne & Clark, 1000; w. 1., 300, 450, 600; hours, X.

ASHER, J. HUDSON.—Sabine Towing Co. owner of vessel.

BARTHNEY.—Name changed to De Bardeleben; W. G. Coyle & Co. owner of vessel.

BETHORE.—Range, 300; system, R. C. of A., 1000; w. 1., 300, 600.

BOGOTA.—Range, 200; system, Navy-Simon, 1000; w. 1., 300, 600.

BRISTOL.—Coastwise Transportation Co. owner of vessel.

CAMBRIDGE (KGR).—Rates, North and South American and transoceanic services, 8 c. per word.

CARPLAKA.—Range, 300; system, Navy-R. C. of A., 1000; w. 1., 300, 450, 600.

CATHAY.—Station operated and controlled by R. C. of A.

CELESTIAL.—Station operated and controlled by I. W. T. Co.

CERRO-EBANO.—Range, 300; system, R. C. of A., 1000.

CHAMBERINO.—System, Navy-Marconi, 1000; w. 1., 300, 450, 600.

CHATTANOOGA.—Range, 300; system, Navy-R. C. of A., 1000; w. 1., 300, 450, 600.

CITY OF LOWELL.—Range, 150; system, Cutting & Washington, 1000; w. 1., 300, 530, 600; hours, X; rates, North and South American and transoceanic services, 8 c. per word; station operated and controlled by I. W. T. Co.

COAXET.—System, Navy-Lowenstein, 1000; w. 1., 300, 450, 600.

CLIFFWOOD.—W. 1., 300, 450, 600.

COLON.—Rates, strike out transoceanic rate.

COMMACK.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000; w. 1., 300, 450, 600.

COMMERCIAL PILOT.—Strike out all particulars.

CONCORD.—Rates, North and South American and transoceanic services, 8 c. per word.

CORDOVA.—System, Kilbourne & Clark, 1000.

CRABTREE.—System, Navy-Marconi, 1000; w. 1., 300, 450, 600.

CRAIGSMERE.—System, Navy-Marconi, 1000; w. 1., 300, 450, 600.

CRANENEST.—System, Navy-Marconi, 1000; w. 1., 300, 450, 600.

CRAWL KEYS.—System, Navy-R. C. of A., 1000.

CUBA (KDRT).—Range, 150; system, R. C. of A., 1000; w. 1., 300, 450, 600.

DAVID McKELVY.—Range, 300; system, R. C. of A., 1000.

- DELAWARE SUN.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
- DIXIE ARROW.—Range, 300; system, R. C. of A., 1000; w. l., 300, 600; hours, X.
- DRYDEN.—Range, 300; system, Federal arc, w. l., 300, 600, 1800.
- EASTERNER.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600; hours, X.
- EAST WIND.—System, Navy-Marconi, 1000; w. l., 300, 450, 600; hours, X.
- EDGEHILL.—System, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
- ELDRIDGE.—W. l., 300, 450, 600.
- FEDERAL.—Range, 300; system, Westinghouse, 100; w. l., 300, 450, 600; rates, North and South American and transoceanic services, 8 c. per word; station operated and controlled by owner of vessel.
- GAFFNEY.—W. l., 300, 450, 600.
- GARFIELD.—Range, 200; system, Navy-R. C. of A., 1000.
- GENERAL G. W. GOETHALS.—Range, 200.
- GEORGIAN.—W. l., 300, 450, 600.
- GLADYSBE.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services, 4 c. per word.
- GLYMONT.—Range, 200.
- HAGOOD.—Range, 300; system, Navy-R. C. of A., 1000.
- HAHATONKA.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.
- HAMMAC.—Range, 300; system, Federal arc, w. l., 300, 600, 1800; station operated and controlled by S. O. R. S.
- HAMPDEN.—Coastwise Transportation Co., owner of vessel.
- HANNAWA.—Range, 300; system, Federal arc, w. l., 300, 600, 1800.
- HARRY LUCKENBACH.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 525, 600; rates, North and South American and transoceanic services, 4 c. per word.
- HERBERT L. PRATT.—Range, 300; system, Navy-Lowenstein, 1000.
- HERMAN FRASCH.—Range, 200; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services, 8 c. per word.
- HULVER.—System, Navy-Simon, 1000.
- INDEPENDENT.—Strike out all particulars.
- JACONA.—System, Navy, 1000; w. l., 300, 450, 600.
- JEAN.—Range, 200; system, I. W. T. Co., 1000.
- JOLEE.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.
- KATRINA LUCKENBACH.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services, 8 c. per word.
- LAKE FREEZEOUT.—System, Navy-R. C. of A., 1000; w. l., 300, 450, 600.
- LEXINGTON.—Rates, North and South American and transoceanic services, 8 c. per word.
- LIEBRE.—Rates, North and South American and transoceanic services, 8 c. per word.
- LILMAE.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services, 4 c. per word.
- MANITOWOC.—Range, 300; w. l., 300, 600; rates, North and South American and transoceanic services, 8 c. per word; Manitowoc S. S. Corp., owner of vessel.
- MIDDLESEX.—Coastwise Transportation Co., owner of vessel.
- MOHAWK (KXE).—Range, 100; system, Cutting & Washington, 1000; rates, North and South American services, 8 c. per word; station operated and controlled by I. W. T. Co.
- MOHEGAN.—Range, 150; system, Cutting & Washington, 1000; w. l., 300, 450, 530, 600; hours, X; rates, North and South American and transoceanic services, 8 c. per word; station operated and controlled by I. W. T. Co.
- MORRISTOWN.—W. l., 300, 450, 600; hours, X.

MOUNT SIDNEY.—Strike out all particulars.

MOUNT SUMMIT.—Strike out all particulars.

MUNISLA.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 600.

NANTASKET.—W. l., 300, 450, 600.

NEBRASKAN.—Station operated and controlled by owner of vessel.

NEW ENGLAND.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.

NEW HAMPSHIRE.—Station operated and controlled by I. W. T. Co.

NISHMAHA.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.

NORFOLK.—Coastwise Transportation Co., owner of vessel.

OHIOAN.—Rates, North and South American and transoceanic services, 8 c. per word.

OKLAHOMA CITY.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, 600.

OPELIKA.—System, Navy-R. C. of A., 1000; w. l., 300, 450, 600.

OPHIS.—W. l., 300, 450, 600.

OSAGE.—W. l., 300, 600.

OSAKIS.—System, Navy-R. C. of A., 1000; w. l., 300, 450, 600.

OZETTE.—System, Navy-R. C. of A., 1000; w. l., 300, 450, 600.

PAN AMERICA.—Station operated and controlled by S. O. R. S.

PANUCO (KMM).—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.

PENINSULA STATE.—Range, 500; system, Federal arc; w. l., 300, 450, 600, 1800; station operated and controlled by S. O. R. S.

PLYMOUTH (KXH).—Range, 100; system, Cutting & Washington, 1000; w. l., 300, 450, 530, 600; hours, X; rates, North and South American and transoceanic services, 8 c. per word; station operated and controlled by I. W. T. Co.

POINT LOMA.—Range, 300.

PRINCETON.—Range, 300; system, R. C. of A., 1000.

PROVIDENCE.—Range, 150; system, Cutting & Washington, 1000; w. l., 300, 450, 550, 600; hours, X; rates, North and South American and transoceanic services, 8 c. per word; station operated and controlled by I. W. T. Co.

PUGET SOUND.—System, Navy-R. C. of A., 1000.

QUEEN.—System, R. C. of A., 1000; w. l., 300, 600.

RADNOR.—System, Navy-R. C. of A., 1000; w. l., 300, 470, 600; hours, X.

REDONDO (KYT).—Range, 300; w. l., 300, 450, 600; hours, X.

RICHCONCAL.—Range, 300; system, Navy-Marconi, 1000.

ROCKAWAY PARK.—Station operated and controlled by I. W. T. Co.

SAN JUAN (KGJ).—Hours, X.

SANTA ALICIA.—Name changed to Edna Christenson.

SANTA FLAVIA.—Harry W. Crosby, owner of vessel.

SATARTIA.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.

SCOTTSBURG.—Station operated and controlled by R. C. of A.

SELMA.—Strike out all particulars.

SILETZ.—System, Navy-Kilbourne & Clark, 1000.

SOLANA.—Range, 300; system, Federal arc, 1000 with chopper; w. l., 300, 600, 1800.

STEEL NAVIGATOR.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.

SUFFOLK.—Coastwise Transportation Co., owner of vessel.

SUSQUEHANNA (KOLN).—Station operated and controlled by I. W. T. Co.

SWIFTSTAR.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.

TAMESI.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.

TOPILA.—W. l., 300, 450, 600.

TOTECO.—W. l., 300, 460, 530, 600.

TRANSPORTATION.—Coastwise Transportation Co., owner of vessel.

TRIUMPH.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.

WAHKEENA.—Range, 200; system, Gray & Danielson, 240.

WALDEN.—System, Navy-R. C. of A., 1000; w. l., 300, 450, 600; hours, X.

- WALTER D. MUNSON.—Range, 150; system, R. C. of A., 1000; w. l., 300, 600.
 WARD.—Range, 200; system, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
 WEKKA.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
 WEST APAUM.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600; hours, X.
 WEST CAVANAL.—System, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
 WEST COHAS.—System, Navy-Kilbourne & Clark, 1000.
 WEST COMPO.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.
 WEST CORUM.—System, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
 WEST ELARA.—System, Navy-Marconi, 1000; w. l., 300, 450, 600; hours, X.
 WESTERN HOPE.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600; hours, X.
 WESTERN KNIGHT.—System, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
 WEST GAMBO.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600; hours, X.
 WEST INSKIP.—System, Navy, 1000; w. l., 300, 450, 600.
 WEST IRA.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
 WEST LASHAWAY.—Hours, X.
 WEST SAGINAW.—Range, 200; system, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
 WEST TOTANT.—System, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
 W. H. TILFORD.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
 WILLIAM A. WHITNEY.—Strike out all particulars.
 WILLIAM M. MILLS.—Range, 150; rates, North and South American and transoceanic services, 8 c. per word.
 WILLSOLO.—System, Navy-Marconi, 1000; w. l., 300, 450, 600.
 WISLA.—Range, 200; system, I. W. T. Co., 1000; w. l., 300, 600.
 W. L. CONNELLY.—System, R. C. of A., 1000; w. l., 300, 450, 600.
 ZAREMBO.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KIZD, *read* De Bardeleben; KZC, *read* KOG; WBL, *read* WWJ; WSJ *read* Edna Christenson; strike out all particulars following the call signals KGB, KJC, KMAU, KOJ, KQP, KUKQ, KUSS, WCK, WDZ, WMB, WPI, and WPJ.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

- ANNAPOLIS, MD. (NAK).—Service, PG; rates, ship service, 6 c. per word.
 ASTORIA, OREG.—Loc. 0.123° 50' 51'', N. 46° 11' 05''.
 BALBOA, C. Z.—Loc. 0.79° 46' 20'', N. 09° 07' 15''.
 BAR HARBOR, ME. (regular station).—Loc. 0.68° 18' 00'', N. 44° 14' 15''.
 BOSTON, MASS. (WYCA).—Call signal changes to WVO.
 CAPE MALA, PANAMA.—Loc. 0.79° 59' 30'', N. 07° 27' 30''.
 CAPE MAY, N. J.—Loc. 0.74° 55' 46'', N. 38° 55' 50''.
 CAYEY, P. R.—Loc. 0.66° 09' 50'', N. 18° 07' 10''.
 CHARLESTON, S. C.—Loc. 0.79° 57' 49'', N. 32° 51' 36''.
 CHATHAM, MASS.—Loc. 0.69° 58' 56'', N. 41° 42' 11''.
 COCO SOLO, C. Z.—Service, 0; hours, N.
 COLON, C. Z.—Loc. 0.79° 54' 01'', N. 09° 21' 56''; service, PG; rates, ship service, 6 c. per word.
 CORDOVA, ALASKA.—Loc. 0.145° 25' 30'', N. 60° 28' 30''.
 DUTCH HARBOR, ALASKA.—Loc. 0.166° 33' 07'', N. 53° 53' 14''.
 EAGLE HARBOR, MICH.—Loc. 0.88° 08' 45'', N. 47° 27' 49''.
 EUREKA, CALIF.—Loc. 0.124° 16' 24'', N. 40° 41' 45''.
 FORT BENJAMIN HARRISON, IND.—Call signal changed to WVS.

- FORT CROOK, NEBR.—Strike out all particulars.
- FORT D. A. RUSSEL, WYO.—Call signal changed to WVW.
- FORT DOUGLAS, UTAH.—Call signal changed to WVX.
- FORT DRUM, P. I.—Call signal changed to WUAL.
- FORT HOWARD, MD.—Call signal changed to WVQ.
- FORT MCPHERSON, GA.—Call signal changed to WVR.
- FORT SHERIDAN, ILL.—Strike out all particulars.
- FORT WINT, P. I.—Call signal changed to WUAK.
- FORT WOOD, N. Y.—Strike out all particulars.
- GUANTANAMO, CUBA.—Loc. $0.75^{\circ} 08' 35''$, N. $19^{\circ} 54' 38''$.
- HEEIA POINT, HAWAII.—Read Honolulu, Hawaii (Heeia Point); loc. $0.157^{\circ} 58' 00''$, N. $21^{\circ} 26' 45''$.
- HONOLULU, HAWAII (Pearl Harbor).—Loc. $0.157^{\circ} 58' 00''$, N. $21^{\circ} 20' 45''$.
- JEFFERSON BARRACKS, MO.—Call signal changed to WVV.
- JUNEAU, ALASKA.—Loc. $0.134^{\circ} 24' 45''$, N. $58^{\circ} 18' 35''$.
- JUPITER, ALASKA.—Loc. $0.80^{\circ} 05' 02''$, N. $26^{\circ} 56' 54''$.
- KETCHIKAN, ALASKA.—Loc. $0.131^{\circ} 38' 51''$, N. $55^{\circ} 20' 45''$.
- KEY WEST, FLA.—Loc. $0.81^{\circ} 48' 21''$, N. $24^{\circ} 33' 22''$.
- KODIAK, ALASKA.—Loc. $0.152^{\circ} 21' 45''$, N. $57^{\circ} 46' 45''$.
- LAKEHURST, N. J.—Loc. $0.74^{\circ} 19' 48''$, N. $40^{\circ} 02' 15''$.
- LA PALMA, PANAMA.—Loc. $0.78^{\circ} 08' 30''$, N. $08^{\circ} 26' 00''$; service, PG; rates, ship service, 6 c. per word.
- MACKINAC ISLAND, MICH.—Service, PG; rates, ship service, 3 c. per word.
- MANAGUA, NICARAGUA.—Loc. $0.86^{\circ} 17' 00''$, N. $12^{\circ} 17' 00''$.
- MANILA, P. I.—Call signal changed to WUAJ.
- MANISTIQUE, MICH.—Loc. $0.86^{\circ} 15' 36''$, N. $45^{\circ} 57' 36''$; service, PG; rates, ship service, 6 c. per word.
- MARSHFIELD, OREG.—Loc. $0.124^{\circ} 13' 33''$, N. $43^{\circ} 20' 38''$; service, 0.
- MIAMI, FLA.—Loc. $0.80^{\circ} 07' 43''$, N. $25^{\circ} 47' 56''$.
- MOBILE, ALA.—Service, PG; rates, ship service, 6 c. per word.
- MOREHEAD CITY, N. C.—Loc. $0.76^{\circ} 44' 00''$, N. $34^{\circ} 43' 30''$; service, PG; rates, ship service, 6 c. per word.
- NAVAL ACADEMY, MD. (NAK).—See Annapolis, Md.
- NAVASSA ISLAND, WEST INDIES.—Loc. $0.74^{\circ} 01' 00''$, N. $18^{\circ} 24' 00''$; service, PG; rates, ship service, 6 c. per word.
- NEW ORLEANS, LA: (NAT).—Loc. $0.90^{\circ} 01' 54''$, N. $29^{\circ} 56' 51''$.
- NEWPORT, R. I.—Loc. $0.71^{\circ} 17' 00''$, N. $41^{\circ} 35' 20''$.
- NEW YORK, N. Y.—Loc. $0.73^{\circ} 58' 48''$, N. $40^{\circ} 41' 58''$.
- NORFOLK, VA.—Loc. $0.76^{\circ} 17' 43''$, N. $36^{\circ} 49' 36''$.
- NORTH HEAD, WASH.—Loc. $0.124^{\circ} 04' 31''$, N. $46^{\circ} 17' 56''$.
- OLONGAPO, P. I.—Loc. $0.120^{\circ} 16' 49''$ E., N. $14^{\circ} 49' 78''$; service, PG; rates, ship service, 6 c. per word.
- PARRIS ISLAND, S. C.—Loc. $0.80^{\circ} 40' 22''$, N. $32^{\circ} 21' 01''$.
- PEKING, CHINA.—Loc. $0.116^{\circ} 47' 00''$ E., N. $39^{\circ} 55' 00''$.
- PETERSBURG, ALASKA.—Strike out all particulars.
- PHILADELPHIA, PA.—Loc. $0.75^{\circ} 10' 50''$, N. $39^{\circ} 53' 20''$.
- PENSACOLA, FLA.—Loc. $0.87^{\circ} 16' 10''$, N. $30^{\circ} 20' 53''$.
- POINT ISABEL, TEX.—Loc. $0.97^{\circ} 12' 33''$, N. $26^{\circ} 04' 10''$.
- PORT AU PRINCE, HAITI.—Loc. $0.72^{\circ} 19' 52''$, N. $18^{\circ} 33' 18''$.
- PORTLAND, ME.—Loc. $0.70^{\circ} 12' 08''$, N. $43^{\circ} 33' 54''$; service, 0.
- PORTSMOUTH, N. H.—Service, 0.
- PUGET SOUND, WASH.—Loc. $0.122^{\circ} 37' 03''$, N. $47^{\circ} 41' 46''$.
- PUERTO OBALDIA, PANAMA.—Loc. $0.79^{\circ} 13' 00''$, N. $09^{\circ} 33' 00''$; service, PG; rates, ship service, 6 c. per word.

QUANTICO, VA.—Loc. $0.77^{\circ} 17' 15''$, N. $38^{\circ} 31' 35''$.
 SAN DIEGO, CALIF.—Loc. $0.117^{\circ} 14' 49''$, N. $32^{\circ} 42' 26''$.
 SAN DOMINGO, P. R.—Loc. $0.69^{\circ} 53' 15''$, N. $18^{\circ} 27' 43''$; rates, ship service, 6 c. per word.
 SAN FRANCISCO, CALIF. (NPG).—Loc. $0.122^{\circ} 22' 52''$, N. $37^{\circ} 39' 18''$.
 SAN FRANCISCO, CALIF. (WYCH).—Call signal changed to WVY.
 SAN JUAN, P. R.—Loc. $0.66^{\circ} 05' 40''$, N. $18^{\circ} 28' 03''$.
 SAN PEDRO, CALIF.—Loc. $0.118^{\circ} 22' 35''$, N. $33^{\circ} 57' 48''$.
 SAVANNAH, GA.—Loc. $0.81^{\circ} 06' 15''$, N. $32^{\circ} 05' 15''$.
 SAYVILLE, N. Y.—Loc. $0.73^{\circ} 06' 12''$, N. $40^{\circ} 44' 36''$.
 SHANGHAI, CHINA (WZI).—Strike out all particulars.
 SITKA, ALASKA.—Loc. $0.135^{\circ} 21' 00''$, N. $57^{\circ} 02' 57''$.
 ST. AUGUSTINE, FLA.— $0.81^{\circ} 17' 18''$, N. $29^{\circ} 53' 10''$.
 ST. PETERSBURG, FLA.— $0.82^{\circ} 38' 00''$, N. $27^{\circ} 46' 15''$.
 TATOOSH, WASH. (regular station).—Loc. $0.124^{\circ} 44' 03''$, N. $48^{\circ} 23' 31''$.
 TONGSHAN, CHINA.—Strike out all particulars.
 VIRGINIA BEACH, VA. (regular station).—Strike out all particulars.
 VLADIVOSTOK, RUSSIA.—Loc. (approximately) $0.131^{\circ} 48' 00''$ E., N. $43^{\circ} 00' 00''$;
 w. l., 3950, variable; service, 0; hours, N.
 WASHINGTON, D. C. (Arlington, NAA).—Loc. $0.77^{\circ} 04' 47''$, N. $38^{\circ} 52' 05''$.
 WASHINGTON, D. C. (Navy Yard, NAL).—Loc. $0.76^{\circ} 59' 46''$, N. $38^{\circ} 52' 22''$.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

WEST LEWARK.—Name changed to Meigs.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NAK, *read* Annapolis, Md. (Naval Academy); NPM, *read* Honolulu, Hawaii (Heeia Point); WJD, strike out all particulars; WVI, strike out all particulars; WVP, *read* WUAL; WVR, *read* WUAK; WVU, *read* WUAJ; WXD, *read* Meigs; WYCA, *read* WVO; WYCB, strike out all particulars; WYCC, *read* WVQ; WYCD, *read* WVR; WYCE, *read* WVS; WYCF, strike out all particulars; WYCG, strike out all particulars; WYCH, *read* WVY; WYCI, *read* WVV; WYCJ, *read* WVX; WYCK, *read* WVW; WZI, strike out all particulars.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

ANTHONY, KANS. (9ZAC).—Station controlled by T. & H. Radio Co.
 BELFAST, ME. (1XR).—Strike out all particulars.
 BOISE, IDAHO (7YA).—Address, Boise High School.
 BOZEMAN, MONT. (7XB).—W. l., variable from 200 to 375.
 BURLEY, IDAHO (7YF).—Strike out all particulars.
 BUFFALO, N. Y. (8XAD).—Station controlled by Federal Telephone & Telegraph Co., 1738 Elmwood Avenue.
 DEFIANCE, OHIO (8ZY).—Address, 1000 Wilhelm Street.
 EL PASO, TEX. (5ZAD).—Address, 811 North Oregon Street.
 FRANKLINTON, LA. (5ZK).—W. l., 200, 375.
 FRESNO, CALIF. (6ZU).—Address, 100 Olive Avenue.
 HAMPTON, N. H. (1XY).—Strike out all particulars.
 HIGHLAND PARK, MICH. (8XAF).—Address, 396 Monterey Avenue.
 HOUSTON, TEX. (5ZAA).—Address, R. F. D. No. 3, Box 29-B, Bellaire Boulevard.
 HOUSTON, TEX. (5ZX).—Address, 2504 Bagby Street.
 KNOXVILLE, TENN. (5XK).—W. l., variable from 200 to 375.
 MEDFORD, MASS. (1XE).—*Read* Medford Hillside, Mass.
 MEDIA, PA. (3ZM).—W. l., 200, 375.

MINNEAPOLIS, MINN. (9ZT).—W. 1., 150, 200, 375; address, 402 Courthouse Building.
MOUNT CLEMENS, MICH. (8XAE).—W. 1., 200, 375.
MULGA, ALA. (5ZY).—Strike out all particulars.
NEW HAVEN, CONN. (1ZC).—Strike out all particulars.
PHILADELPHIA, PA. (3ZG).—Address, 3936 Locust Street.
PITTSBURGH, PA. (8XK).—Address, 7712 Pennsylvania Avenue.
POLYTECHNIC, MONT. (7XD).—Strike out all particulars.
PORTLAND, OREG. (7XA).—Strike out all particulars.
RICHFIELD, UTAH. (6ZH).—Strike out all particulars.
RICHMOND, VA. (3ZP).—Address, 2112 East Clay Street.
SAN DIEGO, CALIF. (6XZ).—Strike out all particulars.
SAN FRANCISCO, CALIF. (6XT).—*Read* Vernon, Calif.; address, 604 Mission Street, San Francisco, Calif.
SANFORD, FLA. (5ZH).—Strike out all particulars.
SCHENECTADY, N. Y. (2XQ).—W. 1., 200, 375, variable.
SOUTH MANCHESTER, CONN. (1XT).—Strike out all particulars.
SOUTH SAN ANTONIO, TEX. (5XI).—Station controlled by Max E. Schneider, Kelly Field, Tex.
TUCSON, ARIZ. (5YP).—Call signal changed to 6YB.
WASHINGTON, D. C. (3ZW).—W. 1., 100, 150, 200, 250.

MISCELLANEOUS.

LOCALIZED RADIO LANDING SIGNALS FOR AIRPLANES.

Radio direction finders and other radio devices have been in use for some time to assist airplanes to land during the night, during fog, or at other time of poor visibility. The most usual method of using radio for this purpose is to transmit from an ordinary elevated antenna at the landing field radio signals which are received on a direction finder located on the airplane. On small planes the direction finder may be simply a coil of wire wound on the fuselage; in larger planes a small rotatable coil may be mounted vertically aft in the plane. This method gives the direction of the landing field, but does not give accurate information as to its distance when the plane is near the landing field.

Several years ago the Bureau of Standards was called upon to develop a method to assist airplanes to accurately locate the landing field when the airplane was quite near. It was desired to develop a method which would give a good signal which would be easily audible over a comparatively large area when the airplane was at comparatively high altitudes, but would be localized within a small area when the airplane was near the ground. The accurate location of the landing field is very important when near the ground.

A method of induction signaling was first tried, using 500-cycle alternating current. This current flowed through a large horizontal single-turn coil, 600 by 800 feet, at the landing field. The coil was tuned to 500 cycles, so that a large current flowed. For the induction signaling the reception on the airplane was made using horizontal coils wound on the lower wings of the airplane. It was found that this method gave a signal which was audible over a wide area when the airplane was near the ground, but was confined to a small area when the airplane was at an elevation of about a mile. This was not satisfactory.

The use of radio-frequency waves was therefore undertaken. Two horizontal coils were placed one above the other. The coils were identical in construction, and placed so that their axes coincided. The current in one coil flowed in a direction opposite to the current in the other coil. A fairly high radio frequency, suitable for direction-finding work, such as 300 kilocycles, was used.

A calculation was made which indicated that the signals radiated from the two coils would be strongest for an airplane flying in a given horizontal plane, whenever the plane was inside a comparatively small ring-shaped area located above the landing field. After the coils had been constructed a careful experimental investigation was made under actual flying conditions, and the results of this calculation were verified. Signals were received on the airplane only when it was nearly above and in the immediate vicinity of the landing field. A Curtiss Type R plane was used for the experimental work for both the induction signaling and the radio signaling.

The Bureau of Standards has just published a paper giving the theory of the radiation from an antenna consisting of two horizontal coils, as used in this work. It is found that if a vertical coil antenna is used for reception on the airplane and if the airplane flies horizontally, the maximum signal is received when the line joining the airplane to the transmitting coils makes an angle of 30° with the vertical, assuming that the effect of the earth is negligible. The region of space within which the signal can be detected by receiving instruments of given sensibility has nearly the form of the space between two inverted coaxial vertical circular cones of finite length having their common apex at the transmitting station. The upper limit of the region within which the signal is audible depends on the sensitivity of the receiving apparatus and is not as clearly defined as the bounding conical surfaces. The signal vanishes when the airplane is directly over the transmitting station, and vanishes rather soon after the airplane passes over the region of maximum signal and flies away from the transmitting station.

The effect on the transmission of having a perfectly conducting earth directly under the transmitting coils has also been investigated, and it has been found that in this case a maximum signal is obtained when the line joining the airplane to the transmitting station makes an angle of $26^\circ 34'$ with the vertical. It is expected that these theoretical studies will be very useful in the design of radio transmitting stations for sending localized landing signals to airplanes.

The results of these investigations are given in Bureau of Standards Scientific Paper No. 431, "The Field Radiated from Two Horizontal Coils," by Gregory Breit. A copy may be purchased for 5 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.—*Submitted by Bureau of Standards.*

A RADIO RELAY RECORDER.

Recording devices have been used for many years in wire and cable telegraphy, but it has only been within the last few years that their use has been extended to radiotelegraphy. The very small amount of energy in a received radio signal, usually only a few microwatts, has made it difficult to construct recorders which would operate from radio signals.

In the last few years several devices have been developed for recording radio signals. One type is photographic and is expensive in operation. Another type uses a sensitive air jet. A third is an electron tube device which operates at the critical point of the characteristic curve of the tube, where the tube is just on the verge of oscillation. These are all very sensitive devices and are designed to operate on currents of a milliampere or less. Their mechanical systems are therefore delicate and require careful adjustment. In some types very sensitive relays are used.

There has recently been developed at the Bureau of Standards a type of recorder which differs from those heretofore available, in that larger currents of the order of 5 milliamperes or more are used, and the whole apparatus is therefore more rugged. Currents of this strength are obtained by amplifying the feeble received signals by the use of the electron tube amplifier. Electrical tuning to the audio frequency which is being received is employed. This relay has been made possible by the development of the electron tube amplifier as a reliable radio instrument suitable for use in engineering practice and not simply as a laboratory instrument. With a cur-

rent of 5 milliamperes or more available, it is possible to use an ordinary telegraph relay, which possesses rugged construction and does not require careful and repeated adjustment for operation. With 5 milliamperes a strong and positive action is obtained.

The received signal after amplification is delivered through a tuned audio-frequency transformer to the plate circuit of an electron tube in which is connected the windings of a high-resistance telegraph relay. A condenser having a capacity of about 1 microfarad is shunted across the relay windings. The movement of the armature of the relay may be made to operate any desired mechanism, such as the usual ink-tape register or other apparatus. The relay may therefore be used for remote control of boats or other vehicles.

The selectivity of the apparatus is greatly increased by the use of audio-frequency tuning of the secondary circuit of the input transformer. This makes duplex operation possible. By the use of two such relays operated in series from the output of the same amplifier, simultaneous records have been made of two messages sent at the same time on slightly different wave lengths. On a double-pen register, with one antenna, simultaneous records have been made of the marking wave and the spacing wave of Annapolis by proper audio-frequency tuning.

This relay has been so constructed that all of the power required for operating the electron tube circuits may be obtained from lighting mains carrying 110-volt, 60-cycle, alternating current. If such alternating current power is not available, the relay is also constructed so as to operate from batteries connected to the proper terminals provided for this purpose.

This device has many applications:

1. Code messages may be received on tape, and the necessity for an experienced operator therefore eliminated. News, market, and weather reports and other material broadcasted by radiotelegraph at fairly high speeds may be received on tape and read by an operator of comparatively little experience.
2. A call system may be used, thus avoiding the necessity of a constant watch being kept by an operator.
3. In line-radio telegraphy a sounder may be operated from the signal transmitted by radio-frequency currents, thus making it unnecessary for the Morse operator to read signals received on a telephone receiver.
4. Any form of mechanism may be operated by radio for the remote control of a moving body. Thus this relay can be used for controlling an automobile, a boat, or an airplane.
5. By means of two recorders of this type connected in series simultaneous reception may be made of two messages on the same antenna.
6. Interference from strays is somewhat reduced by the audio-frequency tuning.

A complete description of this recorder may be found in a paper by F. W. Dunmore, "A relay recorder for remote control by radio," published in the April (1922) issue of the *Journal of the American Institute of Electrical Engineers*.—*Submitted by Bureau of Standards.*

ELEMENTARY RADIO PUBLICATIONS.

The Signal Corps has published two pamphlets which will be found of interest by any person who desires an elementary discussion of electricity and radio.

Signal Corps Radio Communication Pamphlet No. 1, "Elementary Principles of Radio Telegraphy and Telephony," is a pamphlet of 79 pages which presents in simple language the fundamental principles of radio communication and discusses the operation of the more important methods and apparatus for transmitting and receiving, including spark gaps, arcs, electron tubes, crystal detectors, regenerative reception, and radio telephony. The use of the electron tube as a generator, detector, and amplifier, and in beat reception, is discussed. No mathematics is used. The pamphlet contains 56 explanatory figures, many of which are circuit diagrams. A

copy of this pamphlet may be purchased for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.

Signal Corps Training Pamphlet No. 1, "Elementary Electricity," is a pamphlet of 52 pages which presents the fundamental facts of electricity and magnetism. It includes discussions of the flow of the electric current, the action of electric charges, the magnetic field, electromagnetism, batteries, and the action of dynamos. There are 37 explanatory figures and a number of illustrative problems. A copy may be purchased for 15 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.—*Submitted by Bureau of Standards.*

A METHOD OF MEASURING COIL CAPACITIES AND STANDARDIZING WAVE METERS.

In any laboratory in which accurate radio measurements are made it is important to have available exact methods of measuring and comparing frequencies. A method of accomplishing this result has been developed at the Bureau of Standards.

This paper describes a method of adjusting the frequencies of two alternating currents accurately to a ratio which is known. It may be used for the measurement of capacities of inductance coils and for standardizing wave meters, because in both of these an accurate knowledge of frequencies is required.

It is often observed that if a detector is placed in the neighborhood of two radio-frequency electron tube generating sets a musical note is heard in a pair of telephone receivers connected in the detector output even if the frequencies of the two generating sets are not near equality. A measurement of the frequencies of both generating sets reveals the fact that if the note is heard the ratio of the frequencies is very nearly that of two small whole numbers. The reason which makes the musical note appear when the two frequencies are nearly in this ratio is the distortion in the current of the detector circuit caused by the rectifying properties of the detector and at times the distortion of the wave form of the oscillator itself—that is, the action of the detector is to introduce various harmonics. The method used depends on this fact.

The harmonics produced by a circuit of adjustable frequency are made to give beats with the fundamental of a circuit of fixed frequency. The beats are rectified and amplified and are heard as a musical note. When the beat frequency is zero, the ratio of the frequencies is exactly a whole number. This whole number may be made very large, as, for example, 100.

The paper describes the method in detail, and gives applications to frequency standardization and the measurement of coil capacities.—*Submitted by Bureau of Standards.*

VIOLATION OF REGULATIONS.

A number of complaints of violation of article 2 of the International Convention Service Regulations by radio operators on board American vessels have been recently received from Canadian direction-finding stations. This article prohibits the use of 800 meters for commercial traffic; 800 meters should be used only for obtaining radio compass bearings.

The attention of all ship radio operators is invited also to article 35 of the International Convention Service Regulations, which requires shipboard stations to transmit their messages to the nearest coast station. Several foreign land stations have reported American ship stations for violation of this regulation.

Any operator violating these regulations may have his license suspended or revoked.

ALASKAN STATIONS OPENED.

The following-named stations in Alaska opened for the season as follows:

Ikatan (KXW), March 14, 1922.

False Pass (KJL), March 13, 1922.

Yakutat (KKA), March 16, 1922.

Port Walter, Alaska (KEQ), April 2, 1922.

Port Althorp, Alaska (KLW), April 3, 1922.

DAILY POSITION OF VESSELS BY RADIO.

The following information was furnished by the assistant traffic manager of the Radio Corporation of America:

"Mariners are advised that their daily ship position reports may be forwarded without charge if addressed to one of the radio stations given below:

Station.	Call signal.	Station.	Call signal.
Chatham, Mass. (Cape Cod).....	WCC	New York, N. Y.....	WNY
Siasconset, Mass.....	WSC	Cape May, N. J.....	WCY
New London, Conn.....	WLC	San Francisco, Calif.....	KPH

"Such reports are now being printed on the marine pages of several of the daily newspapers on the Atlantic and Pacific coasts."—*From Hydrographic Bulletin, March 22, 1922.*

DATE ON WHICH AN OBSTRUCTION IS SIGHTED.

The attention of shipmasters is invited to the fact that it is very desirable to know the date when ice and other obstructions reported by radio from ship to ship were sighted. Many reports of this kind come to the Hydrographic Office bearing only the date of the radiogram and lacking the date when the obstruction was seen. Cooperation in supplying this additional fact will assist the work of this office and will be thankfully appreciated.—*From Hydrographic Bulletin, March 22, 1922.*

CHANGE IN RATES FOR NAVAL STATIONS.

The notice regarding "Change in rates for naval stations," published in the Radio Service Bulletin for September, 1921, is canceled and the following should be substituted.

Effective November 1, 1921, the delivery rates for traffic destined to points in Panama via naval radio stations in the Canal Zone will be as follows: For the first 10 words (or fraction thereof), 20 cents. For each additional word in excess of 10, 1 cent per word. The foregoing are the land-line delivery rates and are in addition to the published rates for radio reception by the various naval radio stations in the Canal Zone.

RADIO WEATHER REPORT BY KARLSBORGS, SWEDEN, STATION.

From March 15, 1922, Karlsborgs Radio Station (call letters SAJ) will transmit daily at 12.15, G. M. T., on a 2,500-meter wave length, a weather report compiled by the Meteorologic-Hydrographic Office in Stockholm. The report is divided into four parts:

Part I.—Meteorological observations at 7, G. M. T., same day, from the following seven stations:

Station.	Code letter.	Position.
Rost.....	R	Lat., 67° 30' N.; long., 12° 04' E.
Klinn.....	K	Lat., 61° 34' N.; long., 4° 47' E.
Hanstholm.....	Hm	Lat., 59° 18' N.; long., 4° 53' E.
Vinga.....	V	Lat., 57° 07' N.; long., 8° 36' E.
Hammershus (Bornholm).....	Hs	Lat., 57° 38' N.; long., 11° 36' E.
Gotska Sandön.....	G	Lat., 55° 16' N.; long., 14° 47' E.
Bremö.....	B	Lat., 58° 23' N.; long., 19° 11' E.
		Lat., 62° 13' N.; long., 17° 44' E.

The observations, which are preceded by the word "Weatherreport," are transmitted in two groups of five symbols each for every station, thus: BBBDD FvTTS.

"BBB" signifies the barometer reading given in millimeters and tenths of millimeters.

"DD" signifies the direction of the wind, in points, reckoned from the north, as:

- | | |
|-------------------|-------------------|
| 02—Wind from NNE. | 18—Wind from SSW. |
| 04—Wind from NE. | 20—Wind from SW. |
| 06—Wind from ENE. | 22—Wind from WSW. |
| 08—Wind from E. | 24—Wind from W. |
| 10—Wind from ESE. | 25—Wind from WNW. |
| 12—Wind from SE. | 28—Wind from NW. |
| 14—Wind from SSE. | 30—Wind from NNW. |
| 16—Wind from S. | 32—Wind from N. |

00—Calm.

"F" signifies the force of the wind according to the Beaufort scale, given in one symbol. When the force is over 9, the figure 9 is given and the real force is given at the end of the information for the station concerned, preceded by the word "storm"; for example, "Force 11, storm 11."

"v" signifies the weather at the time of observation, as:

- | | |
|--------------------|------------|
| 0—Clear sky. | 5—Rain. |
| 1—Almost clear. | 6—Snow. |
| 2—Half clear. | 7—Haze. |
| 3—Almost overcast. | 8—Fog. |
| 4—Overcast. | 9—Thunder. |

"TT" signifies the air temperature in whole degrees. The temperature under 0° is given by increasing the number indicating the temperature by 50. For example, 01 signifies +1°; 51 signifies -1°, etc.

"s" signifies the state of the sea according to the following scale:

- | | |
|---------------------------------|------------------------------|
| 0—No swell, smooth sea. | 5—Heavy swell, moderate sea. |
| 1—Moderate swell, smooth sea. | 6—Rather high sea. |
| 2—Heavy swell, smooth sea. | 7—High sea. |
| 3—No swell, moderate sea. | 8—Very high sea. |
| 4—Moderate swell, moderate sea. | 9—Extraordinary high sea. |

The letter "x" will replace a symbol to indicate missing data.

Example of Part I:

"Weatherreport R 67020 60515

"K 65808 50573 U 65520 10582

"Hm 62404 4461x V 62004 3166x

"Hs 56232 2661x G 59204 8364x" means:

"The following observations were made to-day at 7 a. m., G. M. T.

Point of observation.	Barometer.	Wind.		Weather.	Temperature.	State of the sea.
		Direction.	Force.			
Rost.....	767.0	SW.	6	Clear.....	- 1°	Heavy swell, moderate sea.
Kinn.....	765.8	E.	5	Clear.....	- 7°	No swell, moderate sea.
Utsire.....	765.5	SW.	1	Clear.....	- 8°	Heavy swell, smooth sea.
Hanstholm.....	762.4	NE.	4	Overcast.....	-11°	
Vinga.....	762.0	NE.	3	Almost clear.....	-16°	
Hammershus.....	756.2	N.	2	Snow.....	-11°	
Gotska Sandön.....	759.2	NE.	8	Almost overcast.....	-14°	
Bremö.....	(No reports.)					

Part II.—Division by atmospheric pressure and changes of atmospheric pressure in Europe at 7, G. M. T., will be given the same day in a short report in the English language.

Part III.—Weather forecasts for the next 24 hours will be given for the following four districts and preceded by the word "Forecasts":

Eastern part of the North Sea (code letter), N.

West coast of Sweden (code letter), V.

Baltic Sea (code letter), Oe.

Gulf of Bothnia (code letter), B.

It will be given in groups of symbols, thus: "ddynt" for each district.

"dd" signifies the forecast of the wind according to the following table:

Wind.	From a direction between—								
	N.-E.	NE.-SE.	E.-S.	SE.-SW.	S.-W.	SW.-NW.	W.-N.	NW.-NE.	Variable.
Light.....	01	06	11	16	21	26	31	36	41
Moderate.....	02	07	12	17	22	27	32	37	42
Fresh.....	03	08	13	18	23	28	33	38	43
Strong.....	04	09	14	19	24	29	34	39	44
Storm.....	05	10	15	20	25	30	35	40	45

00—Very light wind or calm.

"y" signifies forecasts regarding changes in the wind's force, or strength, according to the following table:

0—No change can be given.

1—Unchanged.

2—Increasing.

3—Decreasing.

4—Shifting to the right.

5—Shifting to the left.

6—Gradually increasing.

7—Gradually decreasing.

8—Gradually shifting to the right.

9—Gradually shifting to the left.

"n" signifies forecasts regarding rainfall, according to the following scale:

0—Clear weather.

1—None or insignificant rainfall.

2—Rainfall at a few places.

3—Rainfall at scattered places.

4—Rainfall at several places.

5—General rainfall.

6—Showers at several places (snow in winter).

7—Showers at scattered places (snow in winter).

8—Showers at a few places (snow in winter.)

9—Probable fog.

"t" signifies forecasts regarding changes of temperature, according to the following scale:

0—Unchanged.

1—Rising.

2—Gradually rising.

3—Falling.

4—Gradually falling.

5—About mean temperature.

6—Above mean temperature (more than 3°).

7—Below mean temperature (more than 3°).

8—Probable thaw.

9—Probable frost.

The letter "x" will replace a symbol to indicate missing data.

Example of Part III:

"Forecasts N 02812 V 03200 Oe 04250" means—

"Forecasts until to-morrow noon:

"Eastern part of the North Sea:

"Moderate wind from a direction between north and east, gradually shifting to the right. None or insignificant rainfall. Temperature gradually rising.

“West coast of Sweden:

“Fresh wind between north and east, increasing. Clear weather. Temperature unchanged.

“Baltic Sea:

“Strong wind between north and east, increasing. General rainfall. Temperature unchanged.

“Gulf of Bothnia:

“No report.”

Part IV.—Storm warnings valid until 7 a. m., G. M. T., of the following day will be transmitted in a group of five symbols, thus: GGGGG

The group will be preceded by the word “Gale warning.”

First symbol concerns the Skagerrak.

Second symbol concerns the Kattegatt.

Third symbol concerns the southern part of the Baltic.

Fourth symbol concerns the northern part of the Baltic.

Fifth symbol concerns the Gulf of Bothnia.

“g” signifies the storm warning according to the following scale:

0—No storm warning.

1—Gale (7-10 Beaufort) from a direction between north and west.

2—Gale (7-10 Beaufort) from a direction between south and west.

3—Gale (7-10 Beaufort) from a direction between north and east.

4—Gale (7-10 Beaufort) from a direction between south and east.

5—Gale (7-10 Beaufort) without given direction.

6—Storm (11-12 Beaufort) from a direction between north and west.

7—Storm (11-12 Beaufort) from a direction between south and west.

8—Storm (11-12 Beaufort) from a direction between north and east.

9—Storm (11-12 Beaufort) from a direction between south and east.

The letter “x” will replace a symbol to indicate missing data.

Example of Part IV:

“Gale warning 3033x,” means—

“Storm warning valid until 7 a. m., G. M. T., to-morrow:

“Skagerrak—Gale (7-10 Beaufort) from a direction between north and east.

“Kattegatt—No storm warning.

“South part of Baltic—Gale (7-10 Beaufort) from a direction between north and east.

“North part of Baltic—Gale (7-10 Beaufort) from a direction between north and east.

“Gulf of Bothnia—Missing data.”

B. When necessary, storm warnings and other dangers to navigation will be transmitted on a 600-meter wave length:

For Skagerrak } From Gothenbergs Radio Station, call letters SAB, at 17 and
For Kattegatt } 22 G. M. T.

For South part of Baltic } From Vaxholm Radio Station, call letters SAF, at
For North part of Baltic } 16.50 and 21.50 G. M. T.

For Gulf of Bothnia from Harnösand Radio Station, call letters SAH, at 16.55
and 21.55 G. M. T.

The storm warnings, which are preceded by the signal — — — (TTT), are transmitted in the English language.

The reports regarding light vessels, buoys, and wrecks, and information regarding ice and navigating conditions, will follow the Weather Report instead of at 20 G. M. T., in the order named.—*From Hydrographic Bulletin, Mar. 29, 1922.*

RADIO PRATIQUE FOR MERCHANT VESSELS.

The following is a copy of Circular No. 626-10, issued by the Executive Office, The Panama Canal, February 17, 1922:

"Hereafter ships with clean bills of health, from noninfected ports, and without sickness on board, intending to transit the canal without taking supplies or stores of any kind or landing passengers or cargo, may be granted pratique by radio under the following conditions:

"(a) By making application therefor by radio between the hours of 8 a. m. and 4 p. m. Such application to state—

"(1) That the vessel has a clean bill of health and has no sickness on board.

"(2) Names of ports and places visited within the past ten days.

"(3) That the vessel intends to transit the canal without taking stores of any kind or landing passengers or cargo.

"(b) Radio will be addressed to Chief Quarantine Office, through port captain.

"(c) Pratique will not be considered as granted until reply has been received from port captain, 'Chief quarantine officer grants pratique.'"—*From Hydrographic Bulletin, March 15, 1922.*

REGULATIONS PERTAINING TO THE RADIO BROADCASTING OF WEATHER, CROP, AND MARKET INFORMATION.

1. Forecasts, warnings, and weather reports issued by the Weather Bureau and crop and market reports issued or approved by the Bureau of Markets and Crop Estimates shall be broadcast only from radio stations authorized and licensed to do so by the Bureau of Navigation, Department of Commerce.

2. Broadcasting of weather forecasts and information and crop and market reports shall be confined to radio stations properly equipped for the work and operated by persons holding a commercial second-class or a higher grade of license.

3. No plant will be licensed by the Bureau of Navigation to disseminate weather forecasts and information or crop and market reports, except on the approval of the Chief of the Weather Bureau and of the Chief of the Bureau of Markets and Crop Estimates, respectively.

4. The call letter and location of the station and the official authenticity of the information shall be announced preliminary to each broadcast, and is approximately as follows.

This is located at . The weather forecast and reports issued by the U. S. Weather Bureau are as follows; or, market and crop reports, approved by the Bureau of Markets and Crop Estimates, are as follows:

5. The laws pertaining to the issuance of weather forecasts shall be observed. Violators of the following law will be prosecuted.

SEC. 61. Whoever shall knowingly issue or publish any counterfeit weather forecast or warning of weather conditions falsely representing such forecast or warning to have been issued or published by the Weather Bureau, United States Signal Service, or other branch of the Government service, shall be fined not more than five hundred dollars, or imprisoned not more than ninety days, or both. (Act of March 4, 1909, C 321, 35 Stat., 1088.)

6. All broadcasts shall be according to schedules approved by the Weather Bureau or by the Bureau of Markets and Crop Estimates. No forecasts based on a. m. observations shall be broadcast after 7 p. m. of the same day; no special warnings based on special observations shall be broadcast after midnight of the same day; and no forecasts or warnings based on p. m. observations shall be sent after 7 a. m. of the succeeding day, 75th meridian time applying in all cases.

7. Stations authorized to broadcast official weather forecasts and information and crop and market reports will use a wave length of 485 meters unless otherwise licensed to do so by the Bureau of Navigation, Department of Commerce. This special wave length shall be used for no other purpose.

8. License to broadcast weather forecasts and information and crop and market reports shall be revocable at any time that it may be in the public interest to do so.—*Submitted by Department of Agriculture.*

HOW CAN THE RADIO SERVICE BULLETIN BE MADE MORE VALUABLE TO YOU?

The Bureau of Navigation would like to have any practical suggestions which would be helpful in making this publication of greater value to its readers.

RADIO BROADCASTING.

At the present time two wave lengths are assigned for broadcasting—the wave length of 485 meters for Government reports, such as crop and market estimates and weather forecasts furnished by the Department of Agriculture; the wave length of 360 meters for important news, items, entertainment, lectures, sermons, and similar matter.

Stations conducting this service must have limited commercial licenses and be operated by radio operators licensed by the Department of Commerce holding commercial second-class licenses or higher.

Applications for licenses should be made through the radio inspector of the district in which the station is situated.

The radio inspection districts are as follows:

1. Headquarters, Boston, Mass. (radio inspector, customhouse): Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut.

2. Headquarters, New York, N. Y. (radio inspector, customhouse): New York (County of New York, Staten Island, Long Island, and counties on the Hudson River to and including Schenectady, Albany, and Rensselaer) and New Jersey (Counties of Bergen, Passaic, Essex, Union, Middlesex, Monmouth, Hudson, and Ocean).

3. Headquarters, Baltimore, Md. (radio inspector, customhouse): New Jersey (all counties not included in second district), Pennsylvania (counties of Philadelphia, Delaware, all counties south of the Blue Mountains, and Franklin County), Delaware, Maryland, Virginia, District of Columbia.

4. Headquarters, Savannah, Ga. (the work of this district is being performed by the radio inspector of the third district, customhouse, Baltimore, Md.): North Carolina, South Carolina, Georgia, Florida, Porto Rico.

5. Headquarters, New Orleans, La. (radio inspector, customhouse): Alabama, Mississippi, Louisiana, Texas, Tennessee, Arkansas, Oklahoma, New Mexico.

6. Headquarters, San Francisco, Calif. (radio inspector, customhouse): California, Hawaii, Nevada, Utah, Arizona.

7. Headquarters, Seattle, Wash. (radio inspector, 2301 L. C. Smith Building): Oregon, Washington, Alaska, Idaho, Montana, Wyoming.

8. Headquarters, Detroit, Mich. (radio inspector, Federal Building): New York (all counties not included in second district), Pennsylvania (all counties not included in third district), West Virginia, Ohio, Michigan (lower peninsula).

9. Headquarters, Chicago, Ill. (radio inspector, Federal Building): Indiana, Illinois, Wisconsin, Michigan (upper peninsula), Minnesota, Kentucky, Missouri, Kansas, Colorado, Iowa, Nebraska, South Dakota, North Dakota.

AMATEUR RADIO OPERATOR'S LICENSE SUSPENDED.

First-grade amateur radio operator's license No. 22358 has been suspended for a period of three months on account of the holder of the license violating regulation 133, in that he failed to wait three months between examinations.

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters).

Owner of station.	Location of station.	Wave lengths.	Call signal.
Alabama Power Co.	Birmingham, Ala.	360	WSY
Allen, Preston D.	Oakland, Calif.	360	KZM
Altadena Radio Laboratory	Altadena, Calif.	360	KGO
American Radio & Research Corporation	Medford Hillside, Mass.	360	WGI
Atlanta Constitution	Atlanta, Ga.	360, 485	WGM
Atlanta Journal	do.	360, 485	WSB
Atlantic-Pacific Radio Supplies Co.	Oakland, Calif.	360	KZY
Bamberger & Co., L.	Newark, N. J.	360	WOR
Bible Institute of Los Angeles	Los Angeles, Calif.	360	KJS
Church of the Covenant	Washington, D. C.	360	WDM
Chicago, city of	Chicago, Ill.	360	WBW
Clark University	Worcester, Mass.	360, 485	WCN
Columbia Radio Co.	Youngstown, Ohio	360	WMC
Continental Electrical Supply Co.	Washington, D. C.	360	WIL
Co-radio Co.	Wichita, Kans.	360, 485	WEY
Cox, Warren R.	Cleveland, Ohio.	360	WHK
Crosley Manufacturing Co.	Cincinnati, Ohio.	360	WLW
Daily News Printing Co.	Canton, Ohio	360	WWB
Dallas, city of	Dallas, Tex.	360, 485	WRB
DeForest Radio Telephone & Telegraph Co.	New York, N. Y.	360	WJX
Detroit News	Detroit, Mich.	360, 485	WWJ
Detroit Police Department	do.	360	KOP
Doerr-Mitchell Electrical Co.	Spokane, Wash.	360	KFZ
Doron Brothers Electrical Co.	Hamilton, Ohio.	360	WRK
Doubleday-Hill Electrical Co.	Pittsburgh, Pa.	360	KQV
Do.	Washington, D. C.	360	WMU
Duck Co., William B.	Toledo, Ohio.	360	WHU
Dunn & Co., J. J.	Pasadena, Calif.	360	KLB
Electric Equipment Co.	Erie, Pa.	360	WJT
Electric Lighting Supply Co.	Hollywood, Calif.	360	KGC
Electric Power & Appliance Co.	Yakima, Wash.	360	KQT
Emporium, The	San Francisco, Calif.	360	KSL
Erie Radio Co.	Erie, Pa.	360	WSX
Examiner Printing Co.	San Francisco, Calif.	360	KUO
Fair, The	Chicago, Ill.	360	WGU
Federal Institute of Radio Telegraphy	Camden, N. J.	360	WRP
Federal Telephone & Telegraph Co.	Buffalo, N. Y.	360, 485	WGR
Ford Motor Co.	Dearborn, Mich.	360	WWI
Fort Worth Record	Fort Worth, Tex.	360	WPA
Fort-Bradbury Radio Store	Yakima, Wash.	360	KFY
General Electric Co.	Schenectady, N. Y.	360	WGY
Gilbert Co., A. C.	New Haven, Conn.	360	WCJ
Gimbel Brothers	Philadelphia, Pa.	360	WIP
Gould, C. O.	Stockton, Calif.	360	KJQ
Hallock & Watson Radio Service	Portland, Oreg.	360	KGG
Hamilton Manufacturing Co.	Indianapolis, Ind.	360	WLK
Hatfield Electric Co.	do.	360	WOH
Hawley, Willard P., jr.	Portland, Oreg.	360	KYG
Herrold, Charles D.	San Jose, Calif.	360	KQW
Hobrecht, J. C.	Sacramento, Calif.	360	KVQ
Howlett, Thomas F. J.	Philadelphia, Pa.	360	WGL
Hunter, L. M., and G. L. Carrington	Little Rock, Ark.	360	WSV
Hurlburt-Still Electrical Co.	Houston, Tex.	360, 485	WEV
Interstate Electric Co.	New Orleans, La.	360	WGV
Iowa Radio Corporation	Des Moines, Iowa	360	WHX
J. & M. Electric Co.	Utica, N. Y.	360	WSL
K. & L. Electric Co.	McKeesport, Pa.	360	WIK
Karlows Radio Co.	Rock Island, Ill.	360, 485	WOC
Kennedy Co., Colin B.	Los Altos, Calif.	360	KLP
Kierulff & Co., C. R.	Los Angeles, Calif.	360	KHJ
Kluge, Arno A.	do.	360	KQL
Kraft, Vincent I.	Seattle, Wash.	360, 485	KJR
Lindsay-Weatherill & Co.	Reedley, Calif.	360	KMC
Love Electric Co.	Tacoma, Wash.	360	KMO
Loyola University	New Orleans, La.	360	WWL
Maxwell Electric Co.	Berkeley, Calif.	360	KRE
May (Inc.), D. W.	Newark, N. J.	360	WBS
McBridge, George M.	Bay City, Mich.	360	WTP
McCarthy Bros. & Ford	Buffalo, N. Y.	360	WWT
Metropolitan Utilities District	Omaha, Nebr.	360, 485	WOU
Meyberg Co., Leo J.	Los Angeles, Calif.	360, 485	KYJ
Do.	San Francisco, Calif.	360, 485	KDN
Midland Refining Co.	El Dorado, Kans.	485	WAH
Do.	Tulsa, Okla.	485	WEH
Missouri State Marketing Bureau	Jefferson City, Mo.	485	WOS
Montgomery Light & Power Co.	Montgomery, Ala.	360, 485	WGH
Mulrony, Marion A.	Honolulu, Hawaii	360	KGU
Newspaper Printing Co.	Pittsburgh, Pa.	360	WPB
Noggle Electric Works	Monterey, Calif.	360	KLN

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters)—Continued.

Owner of station.	Location of station.	Wave lengths.	Call signal.
Northern Radio & Electric Co.	Seattle, Wash.	360	KFC
Northwestern Radio Manufacturing Co.	Portland, Oreg.	360	KGN
Nushawg Poultry Farm	New Lebanon, Ohio.	360	WPG
Oklahoma Radio Shop	Oklahoma City, Okla.	360, 485	WKY
Oregonian Publishing Co.	Portland, Oreg.	360	KGW
Palladium Printing Co.	Richmond, Ind.	360, 485	WOZ
Paris Radio Electric Co.	Paris, Tex.	360	WTK
Pine Bluff Co.	Pine Bluff, Ark.	360	WOK
Pomona Fixture & Wiring Co.	Pomona, Calif.	360	KGF
Portable Wireless Telephone Co.	Stockton, Calif.	360	KWG
Post Dispatch	St. Louis, Mo.	360	KSD
Precision Equipment Co.	Cincinnati, Ohio.	360, 485	WMH
Precision Shop, The	Gridley, Calif.	360	KFU
Radio Construction & Electric Co.	Washington, D. C.	360	WDW
Radio Corporation of America	Roselle Park, N. J.	360	WDY
Radio Telephone Shop, The	San Francisco, Calif.	360	KYY
Radio Shop, The	Sunnyvale, Calif.	360	KJJ
Register & Tribune, The	Des Moines, Iowa	360	WGF
Reynolds Radio Co.	Denver, Colo.	360, 485	KLZ
Ridgewood Times Printing & Publishing Co.	Ridgewood, N. Y.	360	WHN
Riechman-Crosby Co.	Memphis, Tenn.	360, 485	WKN
Rike-Kumler Co.	Dayton, Ohio	360, 485	WFO
Rochester Times Union	Rochester, N. Y.	360, 485	WHQ
St. Louis University	St. Louis, Mo.	485	WEW
St. Martins College (Rev. S. Ruth)	Lacey, Wash.	360	KGY
San Joaquin Light & Power Corporation	Fresno, Calif.	360	KMJ
Seeley, Stuart W.	East Lansing, Mich.	485	WHW
Service Radio Equipment Co.	Toledo, Ohio.	360	WJK
Ship Owners Radio Service	New York, N. Y.	360	WDT
Shotton Radio Manufacturing Co.	Albany, N. Y.	360	WNJ
Southern Electrical Co.	San Diego, Calif.	360	KDPT
Southern Radio Corporation	Charlotte, N. C.	360	WBT
Strawbridge & Clothier	Philadelphia, Pa.	360	WFI
Stubbs Electric Co.	Portland, Oreg.	360	KQY
Tarrytown Radio Research Laboratory	Tarrytown, N. Y.	360	WRW
Union College	Schenectady, N. Y.	360	WRL
United Equipment Co.	Memphis, Tenn.	360	WPO
University of Illinois	Urbana, Ill.	360	WRM
University of Minnesota	Minneapolis, Minn.	360, 485	WLB
University of Texas	Austin, Tex.	360, 485	WCM
University of Wisconsin	Madison, Wis.	360, 485	WHA
West Virginia University	Morgantown, W. Va.	360	WHD
Wanamaker, John	Philadelphia, Pa.	360	WOO
Do	New York, N. Y.	360	WWZ
Warner Brothers	Oakland, Calif.	360	KLS
Wasmer, Louis	Seattle, Wash.	360	KHQ
Western Radio Co.	Kansas City, Mo.	360, 485	WOQ
Western Radio Electric Co.	Los Angeles, Calif.	360	KOG
Westinghouse Electric & Manufacturing Co.	East Pittsburgh, Pa.	360	KDKA
Do	Chicago, Ill.	360, 485	KYW
Do	Newark, N. J.	360	WJZ
Do	Springfield, Mass.	360	WBZ
White & Boyer Co.	Washington, D. C.	360	WJH
Williams, Thomas J.	do.	360	WPM
Wireless Telephone Co. of Hudson County, N. J.	Jersey City, N. J.	360	WNO
Yeiser, John O., jr.	Omaha, Nebr.	360	WDV
Young Men's Christian Association	Denver, Colo.	485	KOA
Zamoiski Co., Joseph M.	Baltimore, Md.	360	WKC

SUPPLEMENTAL LIST—FROM APR. 1 TO APR. 15, 1922.

Aldrich Marble & Granite Co., C. F.	Colorado Springs, Colo.	485	KHD
Anthony, Earl C.	Los Angeles, Calif.	360	KFI
Arrow Radio Laboratories	Anderson, Ind.	360	WMA
Auburn Electrical Co.	Auburn, Me.	360	WMB
Beacon Light Co.	Los Angeles, Calif.	360	KNR
Benwood Co.	St. Louis, Mo.	360	WEB
Blue Diamond Electric Co.	Hood River, Oreg.	360	KQP
Braun Corporation	Los Angeles, Calif.	360	KXS
Buckeye Radio Service Co.	Akron, Ohio	360	WQE
Bush, James L.	Tuscola, Ill.	360	WDZ
Central Radio Co.	Kansas City, Mo.	360	WPE
City Dye Works & Laundry Co.	Los Angeles, Calif.	360	KUS
Commonwealth Electric Co.	St. Paul, Minn.	360	WAAH
Cooper, Irving S.	Los Angeles, Calif.	360	KZI
Eastern Radio Institute	Boston, Mass.	360	WAAJ
Electric Supply Co.	Clearfield, Pa.	360	WPI
Elliott Electric Co.	Shreveport, La.	360	WAAQ
Fergus Electric Co.	Zanesville, Ohio.	360	WPL
Findley Electric Co.	Minneapolis, Minn.	360	WCE
Gimbel Brothers	Milwaukee, Wis.	360	WAAK
Groves-Thornton Hardware Co.	Huntington, W. Va.	360	WAAR
Herald Publishing Co.	Modesto, Cal.	360	KXD
Hollister-Miller Motor Co.	Emporia, Kans.	360	WAAZ

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters)—Continued.

Owner of stations.	Location of station.	Wave lengths.	Call signal.
SUPPLEMENTAL LIST—FROM APR. 1 TO APR. 15, 1922—continued.			
Holzwasser (Inc.).....	San Diego, Calif.....	360	KON
Howe, Richard H.....	Granville, Ohio.....	360	WJD
Kansas State Agricultural College.....	Manhattan, Kans.....	485	WTG
Los Angeles Examiner.....	Los Angeles, Calif.....	360	KWH
Minnesota Tribune Co. and Anderson-Beamish Co.....	Minneapolis, Minn.....	360	WAAL
Modesto Evening News.....	Modesto, Calif.....	360	KOQ
Mullins Electric Co., Wm. A.....	Tacoma, Wash.....	360	KGB
Nelson Co., I. R.....	Newark, N. J.....	360	WAAM
New England Motor Sales Co.....	Greenwich, Conn.....	360	WAAQ
New Mexico College of Agriculture & Mechanical Arts.....	State College, N. Mex.....	360, 485	KOB
Prest & Dean Radio Research Laboratory.....	Long Beach, Calif.....	360	KSS
Purdue University.....	West Lafayette, Ind.....	360	WBAA
Radio Service Co.....	Charleston, W. Va.....	360	WAAO
Radio Supply Co.....	Los Angeles, Calif.....	360	KNV
Roswell Public Service Co.....	Roswell, N. Mex.....	360	KNJ
Ship Owners Radio Service.....	Norfolk, Va.....	360	WSN
Spokane Chronicle.....	Spokane, Wash.....	360	KOE
Standard Radio Co.....	Los Angeles, Calif.....	360	KJC
Stix-Baer-Fuller.....	St. Louis, Mo.....	360	WCK
St. Joseph's College.....	Philadelphia, Pa.....	360	WPJ
St. Louis Chamber of Commerce.....	St. Louis, Mo.....	360	WAAE
Taylor, Otto W.....	Wichita, Kans.....	360	WAAP
T. & H. Radio Co.....	Anthony, Kans.....	360	WBL
Union Stock Yards & Transit Co.....	Chicago, Ill.....	360, 485	WAAF
University of Missouri.....	Columbia, Mo.....	360	WAAN

INTERFERENCE BY BROADCASTING STATIONS.

Broadcasting stations should shut off transmitters when not in actual operation to prevent unnecessary interference from carrier wave.

Care should be taken not to extend schedules resulting in interference with the schedules of other stations.

Transmitters must be adjusted so as not to produce unnecessary interference. It has come to the attention of the bureau that some stations have interfered over a band of from 200 to 500 meters which may be regarded as a violation of the law.

DISSEMINATION OF ICE INFORMATION.

The Hydrographic Office gives publicity to all information relative to ice and its movement in the North Atlantic which is received from the Coast Guard Cutter on the ice patrol by the following methods:

(a) By radio broadcast from—

Station.	Seventy-fifth meridian standard time.	Wave length (meters).
Arlington, Va.....	10.30 a. m.....	5,950
	12.00 noon.....	2,650
	10.00 p. m.....	2,650
Boston, Mass.....	11.00 a. m.....	1,620
	5.00 p. m.....	
New York, N. Y.....	10.30 a. m.....	1,832
	5.00 p. m.....	
Philadelphia, Pa.....	10.45 a. m.....	1,948
	5.00 p. m.....	
Norfolk, Va.....	10.45 a. m.....	1,851
	1.00 p. m.....	
Charleston, S. C.....	10.30 a. m.....	2,250
	6.00 p. m.....	
Ice-patrol ship.....	6.00 p. m.....	600

(b) All reports of ice are published in the Daily Memorandum and the weekly Hydrographic Bulletin.

(c) The ice-patrol vessel will give ice information at any time to any ship with which the patrol vessel can communicate on 600 meters wave length.—*From Hydrographic Bulletin, April 12, 1922.*

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, June 1, 1922—No. 62

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name	=Name of station.
Loc.	=Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call	=Call letters assigned.
System	=Radio system used and sparks per second.
Range	=Normal range in nautical miles.
W. l.	=Wave lengths assigned: Normal wave lengths in italics.
Service	=Nature of service maintained:
	PG=General public.
	PR=Limited public.
	P=Private.
	O=Government business exclusively.
Hours	=Hours of operation.
	N=Continuous service.
	X=No regular hours.
	m=a. m. (12 m=midday).
	s=p. m. (12s=midnight).
Rates	=Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co.	=Independent Wireless Telegraph Co.
R. C. of A.	=Radio Corporation of America.
S. O. R. S.	=Ship Owners' Radio Service.
Co.	=Company.
Corp.	=Corporation.
&	=And.
Do.	=Ditto.
c. w.	=Continuous wave.
i. c. w.	=Interrupted continuous wave.
v. t.	=Vacuum tube.
FX.	=Fixed station.

CERTIFICATE: By direction of the Secretary of Commerce this publication is issued as an administration report and is required for the proper transmission of the public business.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

NOTE.—Stations having a wave length of 360 meters transmit news, concerts, etc., and those having a wave length of 435 meters transmit market and weather reports.

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Amarillo, Tex. ¹	WDAG	360	PR(FX)	X	J. Laurance Martin, 605 East Fourth Street.
Atlanta, Ga. ²	WDAW	360, 435	PR(FX)	X	Georgia Railway & Power Co.
Atwood, Kans. ³	WEAD	360	PR(FX)	X	Northwest Kansas Radio Supply Co.
Bakersfield, Calif. ⁴	KDZB	360	PR(FX)	X	Frank E. Siefert, 1402 Twentieth Street.
Do. ⁵	KYI	360	PR(FX)	X	Aired Harrell, 1925 I Street.
Baltimore, Md. ⁶	WCAO	360	PR(FX)	X	Sanders & Stayman Co., 319 North Charles Street.
Bellingham, Wash. ⁷	KDZR	360	PR(FX)	X	Bellingham Publishing Co.
Berkeley, Calif. ⁸	KQI	360	PR(FX)	X	University of California.
Blacksburg, Va. ⁹	WEAE	360	PR(FX)	X	Virginia Polytechnic Institute.
Brownsville, Pa. ¹⁰	WDAQ	360	PR(FX)	X	Hartman-Riker Electric & Machine Co., 312 Market Street.
Burlington, Vt. ¹¹	WCAX	360	PR(FX)	X	University of Vermont.
Canton, Ohio ¹²	WCAD	360	PR(FX)	X	St. Lawrence University.
Centerville, Iowa ¹³	WDAX	360	PR(FX)	X	First National Bank, 101 East Van Buren Street.
Chattalla, Wash. ¹⁴	KDZM	360	PR(FX)	X	E. Hollingworth, 203 North Tower Avenue.
Chicago, Ill. ¹⁵	WDAP	360	PR(FX)	X	Mid West Radio Central (Inc.), Wringley Building.
Cincinnati, Ohio ¹⁶	WAAD	360	PR(FX)	X	Ohio Mechanics Institute.
Clearwater, Calif. ¹⁷	KOK	3375, 4200, 5500.	PR(FX)	X	Federal Telephone Co.
College Park, Ga. ¹⁸	WDAJ	360	PR(FX)	X	Atlanta & West Point R. R. Co.
Columbus, Ohio ¹⁹	WCAH	360	PR(FX)	X	Enteklin Electric Co.
Dallas, Tex. ²⁰	WDAO	360	PR(FX)	X	Automotive Electric Co., Ervay and Corsicana Streets.
Decatur, Ill. ²¹	WCAP	360	PR(FX)	X	Central Radio Service, 211 Main Street.
Defiance, Ohio ²²	WCAQ	360	PR(FX)	X	Tri-State Radio Manufacturing & Supply Co., 309 Clinton Street.
Denver, Colo. ²³	KDYY	360	PR(FX)	X	Rocky Mountain Radio Corp., 1512 Broadway.
Do. ²⁴	KDZQ	360	PR(FX)	X	Motor Generator Co., 429 South Sherman Street.
Detroit, Mich. ²⁵	WCX	360, 435	PR(FX)	X	Detroit Free Press.
Edgewood, R. I. ²⁶	WEAG	360	PR(FX)	X	Nichols-Hindline-Bassett Laboratory, 94 Armington Street.
El Paso, Tex. ²⁷	WDAH	360	PR(FX)	X	Mine & Smelter Supply Co., 412 San Francisco Street.
Eugene, Oreg. ²⁸	KDZJ	360	PR(FX)	X	Excelsior Radio Co., Box 33.
Fargo, N. Dak. ²⁹	WDAY	360, 435	PR(FX)	X	Kenneth M. Hance, 117 Broadway.
Flint, Mich. ³⁰	WEAA	360	PR(FX)	X	Fallain & Lathrop, 104 Walsh Building.

¹ Range, 50; system, composite (v. t. telephone).

² Range, 100; system, composite (v. t. telephone).

³ Loc. 0.101° 03' 10", N. 39° 45' 21"; range, 150; system, composite (v. t. telephone).

⁴ Range, 25; system, composite (v. t. telephone).

⁵ Loc. 0.121° 30' 00", N. 45° 00' 24"; range, 50; system, composite (v. t. telephone).

⁶ Loc. 0.122° 15' 43", N. 37° 52' 23"; system, composite (v. t. telephone).

⁷ Loc. 0.79° 32' 48", N. 40° 01' 20"; range, 25; system, composite (v. t. telephone).

⁸ Loc. (approximately) 0.73° 12' 00", N. 44° 28' 00"; range, 100; system, composite (v. t. telephone).

⁹ Loc. 0.92° 55' 27", N. 40° 36' 55"; range, 50; system, R. C. of A. (v. t. telephone).

¹⁰ Loc. (approximately) 0.122° 55' 00", N. 46° 35' 00"; range, 50; system, composite (v. t. telephone).

¹¹ Loc. 0.87° 37' 30", N. 41° 53' 22"; range, 200; system, composite (v. t. telephone).

¹² Loc. (approximately) 0.84° 30' 00", N. 39° 06' 00"; range, 100; system, composite (v. t. telephone).

¹³ Loc. 0.118° 09' 40", N. 33° 33' 45"; range, 1000; system, Federal arc; hours, 7 a. m.—11 p. m.

¹⁴ Loc. (approximately) 0.84° 27' 00", N. 33° 41' 00"; range, 100; system, composite (v. t. telephone).

¹⁵ Loc. (approximately) 0.96° 48' 00", N. 32° 26' 00"; range, 50; system, composite (v. t. telephone).

¹⁶ Range, 200; system, composite (v. t. telephone).

¹⁷ Range, 150; system, composite (v. t. telephone).

¹⁸ Loc. (approximately) 0.103° 00' 01", N. 40° 00' 00"; range, 100; system, composite (v. t. telephone).

¹⁹ Loc. (approximately) 0.105° 00' 00", N. 39° 45' 00"; range, 50; system, composite (v. t. telephone).

²⁰ Loc. 0.3° 15' 03", N. 42° 19' 40"; range, 200; system, Western Electric Co. (v. t. telephone).

²¹ Loc. (approximately) 0.71° 25' 00", N. 41° 50' 00"; range, 50; system, composite (v. t. telephone).

²² Range, 100; system, composite (v. t. telephone).

²³ Loc. 0.123° 04' 47", N. 44° 02' 47"; range, 100; system, composite (v. t. telephone).

²⁴ Loc. (approximately) 0.96° 45' 00", N. 46° 52' 00"; range, 100; system, composite (v. t. telephone).

²⁵ Loc. (approximately) 0.82° 30' 00", N. 40° 00' 00"; range, 50; system, composite (v. t. telephone).

Commercial land stations, alphabetically by names of stations—Continued.

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Fort Dodge, Iowa. ²²	WEAB	360.....	PR(FX)	X	Standard Radio Equipment Co., 619 Carver Building.
Fort Smith, Ark. ²⁷	WCAC	360.....	PR(FX)	X	John Fink Jewelry Co., 701 Garrison Avenue.
Fresno, Calif. ⁴	KDZH	360.....	PR(FX)	X	Fresno Evening Herald.
Great Falls, Mont. ²⁸	KDYS	360.....	PR(FX)	X	The Tribune.
Hartford, Conn. ²⁹	WDAK	360.....	PR(FX)	X	The Courant.
Honolulu, Hawaii	KDYX	360.....	PR(FX)	X	Star Bulletin.
Houston, Tex. ¹	WCAK	360.....	PR(FX)	X	Alfred P. Daniel, 2504 Bagby Street.
Ithaca, N. Y. ³⁰	WEAI	360.....	PR(FX)	X	Cornell University.
Jacksonville, Fla. ¹	WCAN	360.....	PR(FX)	X	Southeastern Radio Telephone Co.
Do. ³¹	WDAL	360, 485.....	PR(FX)	X	Florida Times-Union.
Kansas City, Mo. ³²	WDFA	360.....	PR(FX)	X	Kansas City Star.
Do. ³³	WHB	360, 485.....	PR(FX)	X	Sweeney School Co., Sweeney Building.
Klamath Falls, Oreg. ³⁴	KDYU	360.....	PR(FX)	X	Herald Publishing Co.
Lawrenceville, Ill. ³⁵	WJB	1625.....	PR(FX)	X	Indian Pipe Line Corp.
Lindsborg, Kans. ³⁶	WDAD	360.....	PR(FX)	X	William L. Harrison, 122 East Lincoln Street.
Little Rock, Ark. ¹	WCAV	360.....	PR(FX)	X	J. C. Dice Electric Co., 113 West Capitol Avenue.
Los Angeles, Calif. ³⁷	KDZD	360.....	PR(FX)	X	W. H. Mitchell, 729 South Broadway.
Do. ³⁸	KDZF	360.....	PR(FX)	X	Automobile Club of Southern California, 260 Figueroa Street.
Do. ³⁹	KDZP	360.....	PR(FX)	X	Newbery Electric Corp., 724 South Olive Street.
Do. ¹	KNX	360.....	PR(FX)	X	Electric Lighting Supply Co., 216 West Third Street.
Milwaukee, Wis. ⁴⁰	WCAY	360.....	PR(FX)	X	Kesselman O'Driscoll Co., 517-519 Grand Avenue.
Minneapolis, Minn. ⁴¹	WCAS	360.....	PR(FX)	X	William Hood Dunwoody Industrial Institute, 818 Superior Boulevard.
Muskogee, Okla. ⁴	WDAV	360.....	PR(FX)	X	Muskogee Daily Phoenix.
Nashville, Tenn. ⁴²	WDAA	360.....	PR(FX)	X	Ward-Belmont School, Belmont Heights.
New Bedford, Mass. ⁴³	WDAU	360.....	PR(FX)	X	Slocum & Kilburn, 23 North Water Street.
Newburgh, N. Y. ⁴⁴	WCAB	360.....	PR(FX)	X	Newburgh News Printing & Publishing Co., 40 Grand Street.
New Orleans, La. ⁴⁵	WCAG	360.....	PR(FX)	X	Daily States Publishing Co., 606 Canal Street.
New York, N. Y. ⁴⁶	WEAF	360.....	PR(FX)	X	Western Electric Co., 463 West Street.
Northfield, Minn. ⁴⁷	WCAL	360.....	PR(FX)	X	St. Olaf College.
North Plainfield, N. J. ⁴⁸	WEAM	360.....	PR(FX)	X	Borough of North Plainfield.
Oakland, Calif. ⁴	KLX	360.....	PR(FX)	X	Tribune Publishing Co.
Ogden, Utah. ⁴⁹	KDZL	360.....	PR(FX)	X	Rocky Mountain Radio Corp., 2311 Washington Avenue.

¹ Range, 50; system, composite (v. t. telephone).⁴ Range, 25; system, composite (v. t. telephone).²² Loc. 0.94° 56' 35", N. 42° 24' 30"; range, 150; system, composite (v. t. telephone).²⁷ Loc. 0.94° 25' 00", N. 35° 22' 55"; range, 25; system, composite (v. t. telephone).²⁸ Loc. 0.111° 15' 26", N. 47° 31' 00"; range, 100; system, composite (v. t. telephone).²⁹ Loc. 0.72° 40' 23", N. 41° 44' 58"; range, 150; system, composite (v. t. telephone).³⁰ Range, 200; system, composite (v. t. telephone).³¹ Loc. (approximately) 0.81° 39' 00", N. 30° 20' 00"; range, 200; system, composite (v. t. telephone).³² Loc. (approximately) 0.94° 36' 16", N. 38° 00' 00"; range, 200; system, Western Electric Co. (v. t. telephone).³³ Range, 200; system, Western Electric (v. t. telephone).³⁴ Loc. 0.121° 53' 40", N. 42° 13' 19"; system, composite (v. t. telephone).³⁵ Loc. 0.87° 41' 15", N. 38° 42' 37"; range, 300; system, DeForest (v. t. telephone and telegraph); rates, none.³⁶ Loc. (approximately) 0.97° 40' 00", N. 38° 33' 00"; range, 25; system, Westinghouse (v. t. telephone).³⁷ Loc. (approximately) 0.118° 00' 00", N. 34° 00' 00"; range, 100; system, composite (v. t. telephone).³⁸ Loc. (approximately) 0.118° 15' 00", N. 34° 08' 00"; range, 150; system, composite (v. t. telephone).³⁹ Loc. 0.87° 50' 00", N. 43° 02' 50"; range, 25; system, composite (v. t. telephone).⁴⁰ Loc. 0.93° 25' 00", N. 44° 58' 20"; range, 100; system, composite (v. t. telephone).⁴¹ Loc. (approximately) 0.86° 47' 00", N. 38° 10' 00"; range, 25; system, composite (v. t. telephone).⁴² Loc. (approximately) 0.70° 53' 00", N. 41° 35' 00"; range, 50; system, composite (v. t. telephone).⁴³ Loc. 0.74° 00' 35", N. 41° 30' 10"; range, 50; system, composite (v. t. telephone).⁴⁴ Loc. (approximately) 0.90° 00' 00", N. 30° 00' 00"; range, 50; system, composite (v. t. telephone).⁴⁵ Loc. (approximately) 0.78° 45' 00", N. 40° 30' 00"; range, 100; system, Western Electric Co. (v. t. telephone).⁴⁶ Loc. 0.93° 09' 14", N. 44° 27' 41"; range, 200; system, composite (v. t. telephone).⁴⁷ Loc. 0.74° 30' 20", N. 40° 37' 33"; system, composite (v. t. telephone).⁴⁸ Loc. 0.122° 61' 43", N. 37° 47' 29"; range, 150; system, composite (v. t. telephone).⁴⁹ Loc. (approximately) 0.111° 59' 00", N. 41° 13' 00"; system, Westinghouse (v. t. telephone).

Commercial land stations, alphabetically by names of stations—Continued.

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Owensboro, Ky. ⁶⁰	WJC	1625.....	PR(FX)	X	Indian Pipe Line Corp.
Pasadena, Calif. ⁴	KDYR	360.....	PR(FX)	X	Pasadena Star-News Publishing Co.
Philadelphia, Pa. ⁵¹	WCAU	360.....	PR(FX)	X	Philadelphia Radiophone Co., 1936 Market Street.
Do. ⁵²	WDAR	360.....	PR(FX)	X	Lit Brothers, Eighth and Market Streets.
Phoenix, Ariz. ¹	KDYW	360.....	PR(FX)	X	Smith Hughes & Co., Third Avenue and Jefferson Street.
Pittsburgh, Pa. ⁵³	WCAE	360.....	PR(FX)	X	Kaufman & Baer Co., Sixth and Smithfield Streets.
Point Reyes, Calif. (Bolinas). ⁵⁴	KDU	12, 100.....	PR(FX)	N	R. C. of A.
Portland, Oreg. ⁵⁵	KDYQ	485.....	PR(FX)	X	Oregon Institute of Technology.
Portsmouth, Ohio ¹	WDAB	360.....	PR(FX)	X	H. C. Summers & Son, 906 Gallia Street.
Quincy, Ill. ⁵⁶	WCAW	360.....	PR(FX)	X	Quincy Herald and Quincy Electric Supply Co.
Do. ⁵⁷	WCAZ	360.....	PR(FX)	X	Robert E. Compton & Quincy Whig-General.
Rapid City, S. Dak. ⁵⁸	WCAT	485.....	PR(FX)	X	South Dakota State School of Mines.
Redwood City, Calif. ⁵⁹	KDYN	360.....	PR(FX)	X	Great Western Radio Corp.
Reno, Nev. ⁶⁰	KDZK	360.....	PR(FX)	X	Nevada Machinery & Electric Co.
Rogers, Mich. ⁶¹	WCAF	300, 450, 600.....	PR(FX)	X	Michigan Limestone & Chemical Co.
Salt Lake City, Utah.....	KDYL	360.....	PR(FX)	X	Telegram Publishing Co.
Do. ⁴	KDYV	360.....	PR(FX)	X	Cope & Cornwell Co., 1138 Michigan Avenue.
San Antonio, Tex. ⁶²	WCAR	360.....	PR(FX)	X	Alamo Radio Electric Co., 608 West Evergreen Street.
San Diego, Calif. ⁶³	KDYM	360.....	PR(FX)	X	Savoy Theater, 236 C Street.
Do. ⁶⁴	KDYO	360.....	PR(FX)	X	Carlson & Simpson, Union and C Streets.
San Francisco, Calif. ⁶⁵	KDZG	360.....	PR(FX)	X	Cyrus Peirce & Co., 433 California Street.
Seattle, Wash. ⁶⁵	KDZE	360.....	PR(FX)	X	The Rhodes Co., 1321 Second Avenue.
Shreveport, La. ⁴	WDAN	360.....	PR(FX)	X	Glenwood Radio Corp., Centenary College.
Springfield, Ill. ⁶⁶	WDAC	485.....	PR(FX)	X	Illinois Watch Co., Ninth and North Grand Avenue.
St. Joseph, Mo. ⁶⁷	WEAK	360.....	PR(FX)	X	Julius B. Abercrombie, 819 North Twenty-third Street.
Syracuse, N. Y. ²²	WDAI	360.....	PR(FX)	X	Hughes Electrical Corp., 411 South Clinton Street.
Tampa, Fla. ⁶⁸	WDAE	360, 485.....	PR(FX)	X	Tampa Daily Times.
Terre Haute, Ind. ⁶⁹	WEAC	360.....	PR(FX)	X	Baines Electric Service Co., 24 South Eighth Street.
Trail, W. Va. ⁷⁰	WCAA	525.....	PR(FX)	X	Meade Pocahontas Coal Co.
Tucson, Ariz. ⁷¹	KDZA	360.....	PR(FX)	X	Arizona Daily Star.
University Place, Nebr. ⁷¹	WCAJ	360, 485.....	PR(FX)	X	Nebraska Wesleyan University.

¹ Range, 50; system, composite (v. t. telephone).⁴ Range, 25; system, composite (v. t. telephone).²² Range, 100; system, composite (v. t. telephone).⁵⁰ Loc. 0.87° 04' 15", N. 37° 46' 47"; range, 200; system, DeForest (v. t. telephone and telegraph); rates, none.⁵¹ System, composite (v. t. telephone).⁵³ Loc. 0.75° 09' 44", N. 39° 57' 06"; range, 25; system, composite (v. t. telephone).⁵⁴ Loc. (approximately) 0.50° 00' 00", N. 42° 00' 00"; range, 50; system, composite (v. t. telephone).⁵⁴ Loc. 0.122° 40' 45", N. 37° 54' 30"; range, 4,000; system, Alexanderson alternator; rates, to Japan 72 c per word and to Hawaii 25 c per word.⁵⁴ Loc. 0.122° 40' 43", N. 45° 31' 08"; range, 200; system, composite (v. t. telephone).⁵⁴ Loc. (approximately) 0.91° 23' 00", N. 39° 56' 00"; range, 100; system, composite (v. t. telephone).⁵⁷ Loc. (approximately) 0.91° 23' 00", N. 39° 56' 00"; range, 100; system, composite (v. t. telephone).⁵⁸ Range, 150; system, composite (v. t. telephone).⁵⁸ Range, 150; system, composite (v. t. telephone).⁵⁸ Loc. 0.119° 53' 54", N. 39° 30' 33"; range, 25; system, composite (v. t. telephone).⁶¹ Loc. (approximately) 0.83° 50' 00", N. 45° 25' 00"; range, 300; system, U. S. Navy, 1,000; rates, none.⁶¹ Loc. (approximately) 0.90° 28' 00", N. 29° 27' 00"; range, 75; system, composite (v. t. telephone).⁶² System, composite (v. t. telephone).⁶² Loc. (approximately) 0.117° 10' 00", N. 32° 43' 00"; range, 100; system, composite (v. t. telephone).⁶² Loc. 0.12° 22' 15", N. 47° 38' 25"; range, 50; system, composite (v. t. telephone).⁶² Loc. 0.89° 58' 31", N. 39° 49' 00"; range, 450; system, composite (v. t. telephone).⁶² Loc. (approximately) 0.94° 51' 00", N. 39° 49' 00"; range, 50; system, composite (v. t. telephone).⁶² Range, 100; system, R. C. of A. (v. t. telephone).⁶² Loc. (approximately) 0.88° 39' 00", N. 39° 29' 00"; range, 100; system, composite (v. t. telephone).⁷⁰ Loc. (approximately) 0.81° 24' 00", N. 37° 34' 00"; range, 150; system, composite (v. t. telephone); rates, none.⁷¹ Loc. 0.96° 42' 20", N. 40° 49' 00"; range, 50; system, DeForest (v. t. telephone).

Commercial land stations, alphabetically by names of stations—Continued.

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Vermilion, S. Dak.....	WEAJ	360.....	PR(FX)	X	University of South Dakota.
Villanova, Pa. ⁷³	WCAM	360.....	PR(FX)	X	Villanova College.
Wenatchee, Wash. ⁷⁴	KDZI	360.....	PR(FX)	X	Electric Supply Co.
Do. ⁷⁴	KZV	360.....	PR(FX)	X	Wenatchee Battery & Motor Co.
Wichita, Kans. ⁷⁵	WEAH	360, 485.....	PR(FX)	X	Wichita Board of Trade and Lander Radio Co.
Worcester, Mass. ⁷⁶	WDAS	360.....	PR(FX)	X	Samuel A. Waite, 49 Benefit Street.
Do. ⁷⁷	WDAT	360.....	PR(FX)	X	Delta Electric Co., 658 Main Street.

⁷³ Loc. 0.75° 20' 03", N. 40° 02' 30"; range, 150; system, composite (v. t. telephone).

⁷⁴ Loc. 0.120° 19' 00", N. 47° 25' 12"; range, 100; system, composite (v. t. telephone).

⁷⁵ Loc. 0.120° 18' 23", N. 47° 25' 30"; range, 50; system, composite (v. t. telephone).

⁷⁶ System, composite (v. t. telephone).

⁷⁷ Loc. (approximately) 0.71° 49' 00", N. 42° 15' 00"; range, 50; system, composite (v. t. telephone).

⁷⁸ Loc. (approximately) 0.71° 49' 00", N. 42° 15' 00"; range, 200; system, composite (v. t. telephone).

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
Anvil ¹	KDYP	Cents. 6	Cents. 6	PG	X	Howard N. Findlay...	Owner of vessel.
Astoria.....	KDYT	.....	.....	PG	X	Richard T. Green Co.	Do.
Calcite ²	KDZN	.....	.....	PG	X	Calcite Transportation Co.	
Dolphin.....	KDYZ	.....	.....	PG	X	Mortimer L. Schiff...	Owner of vessel.
H. F. Alexander.....	KDYK	.....	.....	PG	N	Pacific S. S. Co.....	
Humboldt.....	WHX	8	8	PG	X	Fred Linderman.....	Owner of vessel.
Marore.....	KDZO	.....	.....	PG	X	Guaranty Trust Co. of N. Y.	
Meteor ³	KDYJ	8	8	PG	X	Meteor S. S. Co.....	R. C. of A. Owner of vessel.
Multnomah.....	WMA	8	8	PG	X	Multnomah S. S. Co...	
Tavernilla ⁴	KEMT	.....	.....	PG	X	Panama Canal.....	
Theodore H. Wickwire. ⁵	KDZC	.....	.....			American S. S. Co.....	

¹ Range, 150; system, Kilbourne & Clark, 1,000; w. l., 300, 425, 600.

² Range, 150; system, Navy-Wireless Specialty Apparatus Co., 1,000; w. l., 300, 450, 600; rates, Great Lakes Service, 2 c per word.

³ Range, 150; system, R. C. of A., 1,000; w. l., 300, 600.

⁴ Range, 200; system, Navy arc.

⁵ Range, 150; system, Wireless Specialty Apparatus Co., 1,000; w. l., 300, 600; rates, Great Lakes Service, 2 c per word.

Commercial land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDU	Point Reyes, Calif.....c	WCAN	Jacksonville, Fla.....c
KDYJ	Meteor.....b	WCAO	Baltimore, Md.....c
KDYK	H. F. Alexander.....b	WCAP	Decatur, Ill.....c
KDYL	Salt Lake City, Utah.....c	WCAQ	Defiance, Ohio.....c
KDYM	San Diego, Calif.....c	WCAR	San Antonio, Tex.....c
KDYN	Redwood City, Calif.....c	WCAS	Minneapolis, Minn.....c
KDYO	San Diego, Calif.....c	WCAT	Rapid City, S. Dak.....c
KDYP	Anvil.....b	WCAU	Philadelphia, Pa.....c
KDYQ	Portland, Oreg.....c	WCAV	Little Rock, Ark.....c
KDYR	Pasadena, Calif.....c	WCAW	Quincy, Ill.....c
KDYS	Great Falls, Mont.....c	WCAX	Burlington, Vt.....c
KDYT	Astoria.....b	WCAY	Milwaukee, Wis.....c
KDYU	Klamath Falls, Oreg.....c	WCAZ	Quincy, Ill.....c
KDYV	Salt Lake City, Utah.....c	WDAA	Nashville, Tenn.....c
KDYW	Phoenix, Ariz.....c	WDAB	Portsmouth, Ohio.....c
KDYX	Honolulu, Hawaii.....c	WDAC	Springfield, Ill.....c
KDYZ	Denver, Colo.....c	WDAD	Lindsborg, Kans.....c
KDZ	Dolphin.....b	WDAE	Tampa, Fla.....c
KDZA	Tucson, Ariz.....c	WDAF	Kansas City, Mo.....c
KDZB	Bakersfield, Calif.....c	WDAG	Amarillo, Tex.....c
KDZC	Theodore H. Wickwire.....b	WDAH	El Paso, Tex.....c
KDZD	Los Angeles, Calif.....c	WDAI	Syracuse, N. Y.....c
KDZE	Seattle, Wash.....c	WDAJ	College Park, Ga.....c
KDZF	Los Angeles, Calif.....c	WDAK	Hartford, Conn.....c
KDZG	San Francisco, Calif.....c	WDAL	Jacksonville, Fla.....c
KDZH	Fresno, Calif.....c	WDAN	Shreveport, La.....c
KDZI	Wenatchee, Wash.....c	WDAO	Dallas, Tex.....c
KDJJ	Eugene, Oreg.....c	WDAP	Chicago, Ill.....c
KDJK	Reno, Nev.....c	WDAQ	Brownsville, Pa.....c
KDZL	Ogden, Utah.....c	WDAR	Philadelphia, Pa.....c
KDZM	Centralia, Wash.....c	WDAS	Worcester, Mass.....c
KDZN	Calcite.....b	WDAT	Worcester, Mass.....c
KDZO	Marore.....b	WDAU	New Bedford, Mass.....c
KDZP	Los Angeles, Calif.....c	WDAV	Muskogee, Okla.....c
KDZQ	Denver, Colo.....c	WDAX	Atlanta, Ga.....c
KDZR	Bellingham, Wash.....c	WDAY	Centerville, Iowa.....c
KEMT	Tavernilla.....b	WEAA	Fargo, N. Dak.....c
KLX	Oakland, Calif.....c	WEAB	Flint, Mich.....c
KNX	Los Angeles, Calif.....c	WEAC	Fort Dodge, Iowa.....c
KOK	Clearwater, Calif.....c	WEAD	Terre Haute, Ind.....c
KQI	Berkeley, Calif.....c	WEAE	Atwood, Kans.....c
KYI	Bakersfield, Calif.....c	WEAF	Blacksburg, Va.....c
KZV	Wenatchee, Wash.....c	WEAG	New York, N. Y.....c
WAAD	Cincinnati, Ohio.....c	WEAH	Edgewood, R. I.....c
WCAA	Tralea, W. Va.....c	WEAI	Wichita, Kans.....c
WCAB	Newburgh, N. Y.....c	WEAJ	Ithaca, N. Y.....c
WCAC	Fort Smith, Ark.....c	WEAK	Vermilion, S. Dak.....c
WCAD	Canton, N. Y.....c	WEAM	St. Joseph, Mo.....c
WCAE	Pittsburgh, Pa.....c	WCX	North Plainfield, N. J.....c
WCAF	Rogers, Mich.....c	WHB	Detroit, Mich.....c
WCAH	New Orleans, La.....c	WHX	Kansas City, Mo.....c
WCAJ	Columbus, Ohio.....c	WJB	Humboldt.....b
WCAK	University Place, Nebr.....c	WJC	Lawrenceville, Ill.....c
WCAL	Houston, Tex.....c	WMA	Owensboro, Ky.....c
WCAL	Northfield, Minn.....c		Multnomah.....b
WCAM	Villanova, Pa.....c		

Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Morgan-Lewis ¹	WXQ	War Department, Quartermaster Corps.

¹ Range, 200; system, U. S. Army, 1000; w. l., 300, 600, 1100; service, 0; hours, X.

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921.]

Station.	Call signal.	Wave lengths.	Station controlled by—
Athol, Mass.	1XP	Variable 160-400.	Leon W. Bishop, 160 Cottage Street.
Cleveland, Ohio.	8XT	Variable.	Cleveland Electric Illuminating Co., Illuminating Building.
Conway, Ark.	5XAC	200, 375.	Conway Radio Laboratories.
Dallas, Tex.	5ZAW	200, 375.	Kendall Bros., 3301 Wellborn Street.
Detroit, Mich.	8XO	360.	Detroit News, 615 Lafayette Boulevard.
East Palestine, Ohio.	8ZJ	200, 375.	R. D. McCommon, 268 North Market Street.
Fort Wayne, Ind.	9XH	Variable.	City of Fort Wayne, Department of Public Safety.
Grand Coteau, La.	5XZ	200, 250, 375.	St. Charles College.
Grand Rapids, Mich.	8ZAG	200, 375.	Charles E. Holmes, 310 West Brown Street.
Houston, Tex.	5XAA	Variable.	Hurlburt-Still Electric Co., 1201 McKinney Avenue.
Little Rock, Ark.	5XAB	do.	Dr. L. M. Hunter and G. L. Carrington, 2420 Izard Street.
Milwaukee, Wis.	9YZ	200, 375.	Marquette University, 1115 Grand Avenue.
Minneapolis, Minn.	9YX	200, 375.	Wm. Hood Dunwoody Industrial Institute, 818 Superior Boulevard.
Morgantown, W. Va.	8YE	200, 375.	University of West Virginia, Department of Electrical Engineering.
Newark, N. J.	2XAK	Variable.	I. R. Nelson Co., Bond Street.
Newton, Mass.	1XK	do.	Boston College.
New York, N. Y.	2XAL	425, 3000.	International News Service, 21 Spruce Street.
Oakland, Calif.	6XAR	200, 400.	Great Western Radio Corporation, 19 Minna Street, San Francisco, Calif.
Oklahoma City, Okla.	5ZAV	200, 375.	Le Roy Moffett, jr., 3124 North Broadway.
Philadelphia, Pa.	3XB	250, 275.	Philadelphia Electric Co., 1000 Chestnut Street.
Do.	3XK	275, 1500.	Frederick Strattnner, 1638 North Redfield Street.
San Antonio, Tex.	5XY	Variable 200 to 375.	Alamo Radio Electric Co., 608 West Evergreen Street.
San Francisco, Calif.	6XX	Variable.	R. C. of A., 310 Insurance Exchange Building.
South Pasadena, Calif.	6XAS	do.	Brooke E. Sawyer, 458 South Spring Street, Los Angeles, Calif.
St. Paul, Minn.	9ZAH	200, 375.	Boy Scouts of America.
Tampa, Fla.	4XG	Variable.	Pierce Electric Co.
Washington, D. C.	3YS	200, 375.	George Washington University, 2023 G Street NW.

Special land stations, grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
1XK	First district:	6XAR	Sixth district:
1XP	Newton, Mass.	6XAS	Oakland, Calif.
2XAK	Athol, Mass.	6XX	South Pasadena, Calif.
2XAL	Second district:		San Francisco, Calif.
3XB	Newark, N. J.	8XO	Eighth district:
3XK	New York, N. Y.	8XT	Detroit, Mich.
3YS	Third district:	8YE	Cleveland, Ohio.
4XG	Philadelphia, Pa.	8ZAG	Morgantown, W. Va.
	Do.	8ZJ	Grand Rapids, Mich.
5XAA	Washington, D. C.		East Palestine, Ohio.
5XAB	Fourth district: Tampa, Fla.	9XH	Ninth district:
5XAC	Houston, Tex.	9YX	Fort Wayne, Ind.
5XY	Little Rock, Ark.	9YZ	Minneapolis, Minn.
5XZ	Conway, Ark.	9ZAH	Milwaukee, Wis.
5ZAV	San Antonio, Tex.		St. Paul, Minn.
5ZAW	Grand Coteau, La.		
	Oklahoma City, Okla.		
	Dallas, Tex.		

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ATLANTA, GA. (WGM).—Strike out all particulars.

BIRMINGHAM, ALA.—Hours, X.

CAMP 60, CALIF.—System, De Forest (v. t. telephone and c. w. telegraph).

CAMP 61, CALIF.—System, De Forest (v. t. telephone and c. w. telegraph); w. l., 527.

CASCADA, CALIF.—System, De Forest (v. t. telephone and c. w. telegraph); w. l., 527.
1650.

CHATHAM, MASS. (WCC).—Call signal changed to WIM; system, General Electric Co.,
c. w. and i. c. w.

CHICAGO, ILL. (WBU).—System, De Forest (v. t. telephone and telegraph).

CINCINNATI, OHIO (WLW).—W. l., 360, 485.

CINCINNATI, OHIO (WMH).—Loc. (approximately) $0.84^{\circ} 30' 00''$, N. $39^{\circ} 06' 00''$;
range, 150.

COLUMBUS, OHIO.—Range, 200.

DEARBORN, MICH. (KDEN).—System, De Forest (v. t. telephone).

DENVER, COLO. (KLZ).—Range, 150.

DETROIT, MICH. (KDPH).—Range, 150; system, R. C. of A. (v. t. telephone and telegraph).

DETROIT, MICH. (WWJ).—Range, 200; system, Western Electric Co. (v. t. telephone).

EAST LANSING, MICH.—Range, 50.

EAST MORICHES, N. Y.—Range, 1000-1600; system, I. W. T. Co. arc and Cutting &
Washington spark, 1000; w. l., 300, 600, 1800, 2800; service PG and PR-PR service
with St. Martins, Curacao, Caracas, Maracai, and Puerto Cabello.

FLAT ROCK, MICH.—System, composite (v. t. telephone).

FORT WORTH, TEX. (WPA).—W. l., 360, 485.

FORT WORTH, TEX. (WBAP).—Loc. $0.97^{\circ} 15' 00''$, N. $32^{\circ} 43' 00''$.

GALVESTON, TEX.—System, De Forest (v. t. telephone).

HAMILTON, OHIO (WBAU).—Range, 200.

HARTFORD, CONN.—System, composite (v. t. telephone).

HILLSBORO, OREG.—W. l., 300, 600, 4100, 6200, 8500.

KANSAS CITY, MO. (WUQ).—Range, 150.

KENAI, ALASKA.—Strike out all particulars.

LARAMIE, WYO.—System, De Forest (v. t. telephone).

LATOCHE, ALASKA.—Range, 300.

LIMA, OHIO.—System, De Forest (v. t. telephone).

LONG BEACH, CALIF. (KUXT).—System, Western Electric Co. (v. t. telephone).

LOS ANGELES, CALIF. (KFI).—Hours, X; station operated and controlled by Earle C.
Anthony (Inc.).

MARTINSVILLE, ILL.—System, De Forest (v. t. telephone).

MILWAUKEE, WIS.—Hours, X.

MONTEREY, CALIF.—*Read Del Monte, Calif.*

NEGLEY, OHIO.—System, De Forest (v. t. telephone).

NEW YORK, N. Y. (WDT).—Range, 100.

NEW YORK, N. Y. (WNY).—Range 200-300; system, R. C. of A. (c. w.) and R. C.
of A. Spark, 1000.

NORTHVILLE, MICH.—System, De Forest (v. t. telephone).

PALO ALTO, CALIF.—W. l., 300, 600, 3100, 3700, 4300, 4650, 5850, 7775.

PEDROCITAS, CALIF. (Santa Catalina Island).—System, Western Electric Co. (v. t.
telephone).

PHILADELPHIA, PA. (WGL).—Range, v. t. telephone 50; spark, 300.
 PITTSBURGH, PA. (WPB).—Strike out all particulars.
 PORT HURON, MICH.—System, De Forest (v. t. telephone).
 PORT MOLLER, ALASKA.—Hours, X.
 RENO, NEV.—Range, 150.
 ROCK ISLAND, ILL.—Read Davenport, Iowa: loc. (approximately) $0.90^{\circ} 38' 00''$,
 N. $41^{\circ} 30' 00''$; station operated and controlled by Palmer School of Chiropractic.
 ROSWELL, N. MEX.—W. l., 360, 485.
 RUBY.—System, Halcun, 120.
 SAN FRANCISCO, CALIF. (KUO).—W. l., 360, 485.
 SAVANNAH, GA.—W. l., 300, 450, 600.
 SEATTLE, WASH. (KHQ).—Range, 50.
 SEATTLE, WASH. (KVV).—System, composite (c. w. telephone and telegraph).
 SKAGIT POWER SITE, WASH.—System, composite (c. w. telephone and telegraph).
 SPRINGWELLS, MICH.—System, composite (v. t. telephone).
 SUGARLAND, TEX.—System, De Forest (v. t. telephone).
 SUPERIOR, MICH.—System, General Electric Co. (v. t. telephone).
 TOLEDO, OHIO (WJK).—Range, 300.
 TULSA, OKLA.—Strike out all particulars.
 UNGA ISLAND, ALASKA.—Read Unga, Alaska; range, 300; w. l., 300, 600, 1800.
 WASHINGTON, D. C. (WDW).—Strike out all particulars.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ALABAT.—Strike out all particulars.
 ALAMEDA.—Range, 300; w. l., 300, 450, 600.
 AMERICA.—System, Navy-Liberty spark, 1000 and R. C. of A. (v. t. telephone); w. l., 300, 450, 600, 1800.
 ANOKA.—Strike out all particulars.
 APALACHEE.—Strike out all particulars.
 ARTIGAS.—W. l., 300, 450, 600.
 BALDROCK.—United States & Bermuda Towing Co. owner of vessel.
 BANARAN.—Strike out all particulars.
 BANTU.—System, R. C. of A., 120.
 BATANES.—Strike out all particulars.
 BEAUMONT.—Strike out all particulars.
 BELLOTA.—Strike out all particulars.
 BERNICE.—Range, 150; system, Navy-Simon, 1000; w. l., 300, 465, 600; rates, North and South America and transoceanic services 8 c. per word; station operated and controlled by owner of vessel.
 BILOXI.—Strike out all particulars.
 BLUE HEN STATE.—Name changed to President Garfield.
 BROOKDALE.—Rates, North and South America and transoceanic services 6 c. per word.
 BROXTON.—Strike out all particulars.
 BUCKEYE STATE.—Name changed to President Roosevelt.
 CAPINES.—Strike out all particulars.
 CARIBBEAN.—Range, 300; system, Navy, 1000; Panama Canal, owner of vessel.
 CASTLE TOWN.—System, Navy-R. C. of A., 1000; w. l., 300, 450, 600.
 CATHLAMET.—Station operated and controlled by S. O. R. S.
 CELESTIAL.—Name changed to Margaret Dollar.

- CHESTER SUN.—W. 1., 300,450, 600.
CITY OF SEATTLE.—System, R. C. of A., 1000.
CITY OF SYDNEY.—Range, 200; system, Halcun, 120; w. 1., 300, 600; rates, North and South American and transoceanic services 8 c. per word; station operated and controlled by owner of vessel.
CLONTARF.—Range, 300; system, Navy-W. S. A. Co., 1000; w. 1., 300, 450, 600.
COHASSET.—Station operated and controlled by I. W. T. Co.
COLUMBIA (WIR).—Strike out all particulars.
CRABTREE.—Name changed to W J. Crosby.
CREOLE STATE.—Name changed to President Hayes.
CROFTON HALL.—Range, 300.
CURRIER.—Range, 300.
DARIEN.—Range, 200; system, Navy-Simon, 1000; Panama Canal owner of vessel.
DE BARDELEBEN.—Range 200; system, Navy-Simon, 1000; w. 1., 300, 450, 600.
EASTERN SOLDIER.—Name changed to Lena Luckenbach; Luckenbach S. S. Co. owner of vessel.
EASTERN SWORD.—System, Navy-Marconi, 1000.
EOCENE.—Range, 200.
FAVORITE (KDNV).—Range, 300; system, Navy arc; Panama Canal owner of vessel.
FORT LOGAN.—Strike out all particulars.
FREEPORT SULPHUR No. 2.—System, R. C. of A., 1000; w. 1., 300, 450, 600.
GEORGE B. MACKENZIE.—Range, 300; system, R. C. of A., 1000; w. 1., 300, 450, 600.
GORGONA.—Range, 200; system, Navy-Simon, 1000; Panama Canal owner of vessel.
GRANITE STATE.—Name changed to President Polk.
GULFSTAR.—W. 1., 300, 450, 600.
HALEAKALA.—System, Navy-Kilbourne & Clark, 1000; w. 1., 300, 450, 600.
HAWAIIAN.—W. 1., 300, 450, 600; rates, North and South American and transoceanic services, 8 c. per word.
HEFFRON.—Station operated and controlled by R. C. of A.
HOOSAC.—Strike out all particulars.
HOOSIER STATE.—Name changed to President Lincoln.
HUDSON.—Name changed to President Fillmore.
HUMBOLDT.—Strike out all particulars.
HURON (KUSD).—Name changed to City of Honolulu.
INDIA ARROW.—W. 1., 300, 450, 600.
ISAAC L. RICE.—Strike out all particulars.
J. C. DONNELL.—W. 1., 300, 450, 600.
KAMESIT.—W. 1., 300, 450, 600.
KEOTA.—Strike out all particulars.
KROONLAND.—W. 1., 300, 450, 600; rates, North and South American and transoceanic services, 8 c. per word.
LAKE ARTHUR.—Richmond-New York S. S. Co. owner of vessel.
LAKE FLORIAN.—System, Navy, 1000.
LAKE STIRLING.—Richmond-New York S. S. Co. owner of vessel.
LEVANT ARROW.—W. 1., 300, 450, 600.
LIBERTY GLO.—Range, 300; system, Navy-W. S. A. Co., 1000; w. 1., 300, 450, 600.
MARACAY.—Strike out all particulars.
MARGARET (KZO).—W. 1., 300, 450, 600.
METEOR.—Station operated and controlled by R. C. of A.
MOJAVE.—Strike out all particulars.
MOOSABEE.—Strike out all particulars.
MOSS POINT.—Strike out all particulars.

- MOUNT CLINTON.—System, Telefunken, 1000; w. l., 300, 450, 600, 1800.
- NEW YORK (KSN).—United Transatlantic Lines (Inc.) owner of vessel.
- NORLINA.—Range, 300.
- OLD NORTH STATE.—Name changed to President Van Buren.
- OSAKIS.—Name changed to Manhattan Island.
- OYAKA.—Strike out all particulars.
- PANHANDLE STATE.—Name changed to President Monroe.
- PARISMINA.—Range, 250.
- PENOBSCOT.—Penobscot S. S. Co. owner of vessel.
- PONTCHARTRAIN.—Strike out all particulars.
- PRESIDENT POLK.—System, Navy-R. C. of A., 1000.
- PRINCESS MATOIKA.—Name changed to President Arthur.
- RANSOM B. FULLER.—System, R. C. of A., 1000.
- RELIANCE.—Range, 200; system, Telefunken, 1000; w. l., 300, 450, 600, 1800; rates, North and South American and transoceanic services, 8 c. per word; station operated and controlled by owner of vessel, care of United American Lines, 39 Broadway, New York, N. Y.
- RESOLUTE (KDYA).—Range, 200; system, Telefunken, 1000; w. l., 300, 600, 1800; rates, North and South American and transoceanic services, 8 c. per word; station operated and controlled by owner of vessel, care of United American Lines, 39 Broadway, New York, N. Y.
- ROBIN ADAIR.—W. l., 300, 450, 600.
- RUTH ALEXANDER.—Call signal changed to WDR.
- SANTA FLAVIA.—W. l., 300, 450, 525, 600; International Packing Co. owner of vessel.
- SANTA OLIVIA.—W. l., 300, 450, 600.
- SEACONNET.—Seaconnet S. S. Co. owner of vessel.
- SEATTLE SPIRIT.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
- SKAGWAY.—Station operated and controlled by S. O. R. S.
- ST. CHARLES.—Strike out all particulars.
- ST. NICHOLAS.—Range, 300; w. l., 300, 600.
- ST. PAUL.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services, 10 c. per word.
- SUNELSECO.—System, Navy-Lowenstein, 1000; rates, North and South American and transoceanic services, 8 c. per word.
- THEODORE H. WICKWIRE, JR.—Rates, Great Lakes service, 2 c. per word.
- TUSCAN.—W. l., 300, 450, 600; Merchant & Miners Transportation Co. owner of vessel.
- UTOKA.—Strike out all particulars.
- VIZCAYA.—Range, 500; system, composite, 1000; w. l., 300, 600; service, PG; hours, X; Ynchausti S. S. Co. owner of vessel.
- WABASH.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, 600.
- WALTER A. LUCKENBACH.—System, Kilbourne & Clark, spark, 1000; and Federal arc; w. l., 300, 450, 600, 1800.
- WALTER JENNINGS.—System, R. C. of A., 1000.
- WENATCHEE.—Name changed to President Jefferson.
- WEST CATANACE.—Station operated and controlled by I. W. T. Co.
- WEST CHESWALD.—W. l., 300, 450, 600.
- WESTERN WORLD.—Station operated and controlled by S. O. R. S.
- WHITTIER.—Strike out all particulars.
- WM. ROCKEFELLER.—System, R. C. of A. (v. t. telephone and telegraph) and R. C. of A., spark, 1000.
- YOSEMITE (KDWE).—Station operated and controlled by owner of vessel.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDAR, *read* President Monroe; KDCI, *read* President Fillmore; KDED, *read* Lena Luckenbach; KDHF, *read* President Van Buren; KDLB, *read* President Hayes; KDOT, *read* President Jefferson; KDOZ, *read* President Polk; KDRW, *read* President Roosevelt; KDTC, *read* President Garfield; KDUV, *read* Margaret Dollar; KDUY, *read* President Lincoln; KLN, *read* Del Monte, Calif.; KUSD, *read* City of Honolulu; KVI, *read* Unga, Alaska; WDR, *read* Ruth Alexander; WFOI, *read* Manhattan Island; WIM, *read* Chatham, Mass.; WLS, *read* President Arthur; WOC, *read* Davenport, Iowa; WXOE, *read* W. J. Crosby; strike out all particulars following the call signals, KDAL, KDKO, KEKX, KELX, KENZ, KERK, KETJ, KIKP, KIMP, KIQJ, KOK, KPAI, KQEE, KSAI, KVEA, KZZ, WDW, WEH, WGM, WHT, WHX, WIR, WJEA, WKK, WPB, WQAU, WSAE, WSAO, WXAU, and WXUA.

GOVERNMENT LAND STATIONS BY NAMES OF VESSELS.

Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

CIRCLE CITY, ALASKA.—*Read* Circle, Alaska; w. l., 1350; service, PG.
 FAIRBANKS, ALASKA.—Service, PG.
 FORT EGBERT, ALASKA.—Service, PG.
 FORT GIBBON, ALASKA.—Service, PG.
 FORT ST. MICHAEL, ALASKA.—Service, PG.
 FORT YUKON, ALASKA.—Service, PG.
 HOLY CROSS, ALASKA.—Service, PG.
 IDITAROD, ALASKA.—Service, PG.
 KOTLIK, ALASKA.—Service, PG.
 LIVENGOD, ALASKA.—Service, PG.
 McGRATH, ALASKA.—Service, PG.
 NOME, ALASKA.—Service, PG.
 NULATO, ALASKA.—Service, PG.
 WRANGELL, ALASKA.—Service, PG.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

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MISSOURI.—Strike out all particulars.
 SLOCUM.—Call signal changed to WXS.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NKF, strike out all particulars; WVA, *read* Circle, Alaska, and WWY, *read* WXS.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

ATLANTA, GA. (4XH).—Address 76 East Fifth Street.
 AUSTIN, TEX. (5ZAG).—Address 711 West Twenty-third Street.
 BALTIMORE, MD. (3XD).—Strike out all particulars.
 BATON ROUGE, LA. (5ZAC).—Address 918 Convention Street.
 BEDFORD, IOWA (9XAJ).—Strike out all particulars.
 BERKELEY, CALIF. (6XK).—Address 2436 Stuart Street.
 BIRMINGHAM, ALA. (5XC).—Address Brown-Marx Building.
 BOSTON, MASS. (1YS).—Station controlled by Massachusetts Radio and Telegraph School, 18 Boylston Street.
 BROOKLINE, MASS. (1XA).—W. l., variable 75-350.

BUENA VISTA, VA. (8ZAA).—Address Walnut Street.
CAMBRIDGE, MASS. (1XAB).—Address 139 Main Street.
CAMBRIDGE, MASS. (1XM).—W. 1., variable.
CASPER, WYO. (7ZO).—Address 1022 South Ash Street.
CHICAGO, ILL. (9XAN).—Strike out all particulars.
CHICAGO, ILL. (9 XB).—W. 1., 350-450.
CHICAGO, ILL. (9YL).—Address Thirty-third and Federal Streets.
CINCINNATI, OHIO (8XAH).—W. 1., variable 150-550.
CLIFFWOOD, N. J. (2XF).—Address 463 West Street, New York, N. Y.
COLLEGE STATION, TEX. (5XB).—W. 1., 200, 375, variable.
DAVENPORT, IOWA (9XE).—W. 1., variable.
DEAL BEACH, N. J. (2XJ).—Address 463 West Street, New York, N. Y.
GREEN HARBOR, MASS. (1XD).—Address 463 West Street, New York, N. Y.
HOUMA, LA. (5ZAB).—Station operated by Pullen Brothers, 503 Roussel Street.
ITHACA, N. Y. (8XU).—W. 1., variable.
JULIFF, TEX. (5ZW).—Station operated by Elm Grove Plantation.
LANSING, MICH. (8ZF).—Strike out all particulars.
LAREDO, TEX. (5ZAN).—Address Fort McIntosh, Tex.
LOS ANGELES, CALIF. (6XAK).—W. 1., variable; address 950 South Flower Street.
OAKLAND, CALIF. (6XW).—Address 2830 Eleventh Avenue.
PORTLAND, OREG. (7XF).—Address 1556 East Taylor Street.
ROCK ISLAND, ILL. (9XAC).—Station controlled by Karlowa Radio Corp., 606 Best Building.
SAN ANTONIO, TEX. (5ZAK).—Address Kelly Field, Tex.
SAN ANTONIO, TEX. (5ZR).—Strike out all particulars.
SAN FRANCISCO, CALIF. (6ZAH).—Strike out all particulars.
SAN GABRIEL, CALIF. (6XS).—W. 1., variable; address Rose Road and Mission Drive.
VERNON, CALIF. (6XT).—Strike out all particulars.
Woodside, N. Y. (2XAC).—W. 1., variable 200-400.

MISCELLANEOUS.

NEW INSTRUCTIONS FOR HANDLING RADIO TRAFFIC ACCOUNTS.

The following instructions shall govern transactions under paragraph 4 of licenses for ship radio stations:

Accounts in respect of all charges due or payable under the International Radiotelegraph Convention in respect of messages exchanged between the station hereby licensed and other stations shall be recorded monthly as follows:

(a) *Accounts for traffic through coastal stations.*—The licensee shall maintain a monthly abstract of all traffic transmitted or received, which shall show separate accounts for each controlling agency with which traffic is exchanged. Such abstract must show, by columnar arrangement or recapitulation, the origin, address, routing, and check of all messages handled, and, in addition, debit or credit entries of tolls to the controlling foreign administration for traffic routed via foreign coastal stations and similar entries to the controlling Government departments or commercial companies for traffic routed via United States coastal stations.

(b) *Accounts for traffic from ship to ship.*—The licensee shall maintain an abstract as under (a) above, except that controlling or operating companies will be substituted for foreign administrations.

CLASSIFICATION OF ACCOUNTS COVERED BY SUBPARAGRAPH (A).

The accounts under subparagraph (a) are based upon the traffic returns or abstracts of coastal stations and are divided into two classes: First, international or foreign accounts; and, second, domestic or United States accounts.

Accounts for messages of first class.—Accounts of the foreign or international class will be received by the licensee from the Secretary of Commerce or from such other Government agency as may be designated by the Secretary of Commerce to clear and liquidate foreign accounts as required by the International Radiotelegraph Convention. Payment of such accounts must be made in full as rendered within 90 days of receipt of itemized invoices, the payment to be made by the licensee or his duly authorized agent to the

office from which the accounts are received. Any protests or claim for refunds or reimbursements of any nature whatsoever shall accompany the settlement for the account which includes the messages upon which protests or claims are based.

Accounts for messages of second class.—Accounts of the domestic or United States shore stations will be handled in exactly the same manner as those for messages of the foreign or international class, except the licensee will receive the domestic accounts from the Government department or commercial company which controls the coastal station. Payment of such accounts must be made by the licensee to the department or company from which received and in the same manner as prescribed for foreign or international accounts, except that the licensee is authorized to enter into any special agreement with the controlling departments or companies with relation to settlement of accounts. Protests or claims may be handled as mutually agreed upon between the licensee and controlling department or company.

Accounts covered by subparagraph (b).—The accounts covered by subparagraph (b) will be exchanged directly between the licensees of the ships concerned and in such manner as may be mutually agreed upon by both parties.

Prepayment of tolls.—The International Radiotelegraph Convention requires that the charges on messages filed on shipboard shall be paid by the sender. The licensee shall, therefore, require prepayment for all tolls due on messages, including those covering ships' business (the tolls so collected not to include special delivery charges).

Submission of reports and moneys collected to licensee.—The International Radiotelegraph Convention requires that all documents and originals shall be forwarded by the shipboard station to the radio management at least once a month. The licensee shall require shipboard stations to transmit to him or his authorized agent all abstracts, original message copies, and toll money collected.

Forwarding charges or tolls.—Upon receipt of the records and remittances from the shipboard station the licensee shall set aside or deposit in a special deposit account all message tolls which are due other radio stations and connecting telegraph or cable lines for the transmission of such messages to their destination, and the amounts so set aside or deposited shall not be available for any other purpose than that for which the original payment was made; that is to say, for the transmission beyond office of origin to destination. It is further required that message tolls so set aside or deposited shall be held for a period of not less than two years, at the expiration of which time the licensee, provided claims have not been entered covering such deposits, may withdraw any such unobligated amounts for other purposes, with the approval of the Secretary of Commerce or such other Government agency as the Secretary of Commerce may designate.

Preservation of records.—The licensee shall retain all original documents for a period of not less than two years.

Procedure on termination of ship licenses.—Upon the termination of the station or cancellation of a ship station license the licensee shall forward all unclaimed funds and records pertaining thereto to the Secretary of Commerce, or to such other Government agency as the Secretary of Commerce may designate. The department designated will, upon receipt, clear proper outstanding claims presented within the two-year period required for the retention of records, and in event any funds remain unobligated the remaining funds will be returned to the former licensee.

Inspection of radio documents and accounts.—The radio records and accounts referred to in the preceding paragraphs of these instructions shall be held available for such inspection as the Secretary of Commerce may deem necessary or direct within the two-year period hereinbefore mentioned.

Approved.

D. B. CARSON,
Commissioner of Navigation.

HERBERT HOOVER,
Secretary of Commerce.

LOST COMMERCIAL RADIO OPERATORS' LICENSES.

Printed below is a list of radio operators' licenses which have been reported to this bureau as having been lost. Should any of them be found, they should be returned to the bureau for cancellation. Inspectors and others concerned should see that lost licenses are not being used by unauthorized persons.

Name.	Grade.	Number.	Date issued.	Port issued.
Bromley, A. C.	First.	20186	Dec. 1, 1919	Seattle.
Drucker, David.	Second.	17267	July 19, 1920	Baltimore.
Engel, George C.	First.	17794	June 18, 1921	New York.
Ferguson, S.	do.	2244	Sept. 8, 1921	Seattle.
Hart, Rexford E.	do.	19264	Dec. 3, 1920	New York.
Landerman, G. W.	do.	20881	Feb. 10, 1921	Do.
Lippin, Bernard H.	do.	21471	Mar. 11, 1920	Boston.
Moratis, John C.	Second.	15265	Aug. 13, 1920	Chicago.
Salim, Salim.	First.	916	Nov. 7, 1921	New York.
Shulsinger, Max.	do.	678	Aug. 3, 1921	Do.
Shumate, John R., Jr.	do.	668	July 29, 1921	Do.
Smith, Roy A.	do.	3241	Jan. 11, 1922	San Francisco.

HYDROGRAPHIC INFORMATION ON PACIFIC COAST.

Under date of May 17 the Navy Department advised as follows:

SAN FRANCISCO, CALIF. (NPG).—Time, 12 noon (c. w. 4650 meters) following weather bulletin; time, 10.30 p. m. (spark 1908 meters) following weather bulletin.

NORTH HEAD, WASH. (NPE).—Time, 4.30 p. m. (spark 2700 meters) following weather bulletin; time, 11.30 p. m. (spark 2700 meters) following weather bulletin.

SEATTLE, WASH. (NVL).—Time, 4.00 p. m. (spark 1988 meters); time, 9.00 p. m. (spark 1988 meters).

All times are seventy-fifth meridian.

INFORMATION FROM THE BERNE BUREAU.

Greece.—The coast station Athens No. 2 (SXB), open to general public correspondence, exchanges a large number of official messages. The state of war which existed in Greece has resulted in an increase of the number of these messages to such an extent that it is overburdened with work and is unable to assure public correspondence other than that under normal conditions.

In order to remedy this state of affairs, the Radio Telegraph Direction Service of the Hellenian Royal Navy has decided to build a new station (SXG), 60 kilowatts, to which would fall the exchange of official messages of the State. The station SXB can then devote itself to general public correspondence. In spite of the fact that the Hellenian office has done everything to complete this, for purely technical reasons, they have not yet permitted the placing in operation of the station SXG.

Desiring to improve to a high degree as possible the public service with ships this office will open in a short time near Athens a station exclusively for public radio-telegraph correspondence.

British Indies.—The number of three-letter call signals reserved for the British Indies not being sufficient, they also will employ combinations of four letters.

CHANGE IN HOURS.

The legal time is advanced one hour in Belgium, beginning March 26; in France, from March 25 to October 7; in Great Britain, from March 26 to October 8; and in the Netherlands, from March 26 to October 8.

Cyrenaica.—The coast station Tobruch is open from 6 a. m. to 8 p. m. (Greenwich mean time).

Portugal.—The coast station Porto has been dismantled.

Australia.—Coast station Willis Islet is closed.

Denmark.—Coast station of Blaavand sends, when necessary, at 12.20 and 22.20 (Danish time), reports upon the presence of icebergs in Danish territorial waters.

France.—The coast station Lorient-Pen-Mane is open to general public service.

Great Britain.—Long-distance service of Poldhu will hereafter be transmitted by Clifden radio station.

Mauritius.—The coast station Mauritius is open to PG service from 4 to 8 a. m. and from 12 noon to 4 p. m. (Greenwich mean time). The rate per word is 60 centimes, without minimum.

Italy.—Every bearing transmitted by an Italian radio compass station at the request of a ship station charges a fixed rate of 6 francs. The radio compass stations record all bearings which they may give to a ship station on a radiogram blank. These radiograms are handled, in regard to the liquidation of accounts, as ordinary radiograms, originating from ships and destined for Italy.

DISTRIBUTION OF PUBLICATIONS OF BUREAU OF NAVIGATION.

All orders and inquiries concerning the publications named below should be forwarded to the Superintendent of Documents, Government Printing Office, Washington, D. C. Do not make remittances to the Bureau of Navigation or to other agencies of this bureau.

List of Merchant Vessels of the United States (annual), \$1.25.

Code List of Seagoing Vessels With Names of Owners (annual), 25 cents.

American Documented Seagoing Merchant Vessels of 500 Gross Tons and Over (monthly), annual subscription, 75 cents.

Navigation Laws of the United States (quadrennial), \$1.

Amendments to Navigation Laws (occasional), 10 cents.

List of Commercial, Government, and Special Radio Stations (annual), 15 cents.

List of Amateur Radio Stations (annual), 15 cents.

Radio Service Bulletin (monthly), annual subscription, 25 cents; single copies, 5 cents.

Radio Communication Laws of the United States (occasional), 15 cents.

Measurement of Vessels (occasional), 15 cents.

CREDIT ALLOWED GRADUATES OF RADIO CORRESPONDENCE SCHOOLS.

Radio inspectors and others interested are advised that graduates of radio correspondence schools are advised that 5 per cent for experience is the maximum credit allowed in examination for radio operator's license.

ALASKAN STATIONS OPENED.

The stations named below opened for the season, as follows:

Alitak (KYL), May 7.

Akutan (KMW), May 8.

Libbyville (KMT), May 12.

Funter (KXX), May 11.

Naknek (KMK), May 16.

Chisik Island (KUCP), May 19.

Snag Point (KHF), May 22.

Koggiung (KVV), May 23.

OPERATOR'S LICENSE SUSPENDED.

First-class license No. 21062, issued at New York May 18, 1921, has been suspended for a period of three months on account of the holder of the license violating article 6 of the International Convention Service Regulations, in that he transmitted superfluous signals.

INFORMATION REGARDING RADIO ACTIVITIES IN FOREIGN COUNTRIES.

A new record has been attained by the wireless service of the "Drahtlose Uebersee-Verkehr, A. G." (Overseas Wireless Company). On March 16, last, a total of 50,000 words were exchanged via radio at the wireless stations of this company at Nauen and Eilvese. Since the reconstruction of commercial relations the traffic through these wireless stations has been steadily increasing. In August, 1919, the entire business for the month only amounted to about 100,000 words. It increased to 550,000 words in June, 1921, and in February, 1922, rose to 1,000,000 words.

A radio station has just been established at Kaisariye, Anatolia, and the first message was sent to Moscow. The Angora Government announced that another radio station would be opened at Mersina for use in communicating with European capitals.

It is officially announced that experimental transmissions have begun between Leafeld, England, and Cairo wireless stations, and as soon as the preliminary trials are complete a public service will be inaugurated.

INCREASE IN RATES FOR SHIP STATIONS OPERATED AND CONTROLLED BY SHIP OWNERS
RADIO SERVICE.

The following-named ship radio stations which are operated and controlled by the Ship Owners Radio Service will increase the ship rate from 4 cents to 8 cents per word for all classes of ship service, beginning July 1 next: *Abner Coburn*, *Allaguash*,¹ *Achilles*,¹ *Andrea F. Luckenbach*, *Anniston City*, *Atlanta City*, *Ausable*,¹ *Benjamin F. Packard*, *Colon*,¹ *Darien*,¹ *Deerfield*, *F. J. Luchenbach*, *Florence Luckenbach*, *Fred'k Luckenbach*, *General G. W. Goethals*,¹ *General O. H. Ernst*,¹ *Harry Luckenbach*, *Hattie Luckenbach*, *Jacob Luckenbach*, *Julia Luckenbach*, *Katrina Luckenbach*, *K. I. Luckenbach*, *Lena Luchenbach*, *Lewis Luckenbach*, *Libby Maine*, *Manitowoc*,¹ *Muskegon*,¹ *Oneonta*, *Pleiades*, *Poznam*, *Robin Adair*, *Robin Goodfellow*, *Robin Gray*, *Robin Hood*, *San Juan*, *Speejacks*, *Starr*, *Steel Voyager*, *Ulysses*,¹ *Wallula*, *Walter A. Luckenbach*, *Winnebago*,¹ *Winneconne*.¹

The radio ship stations owned by the Alaska Steamship Co. which are operated by the Ship Owners Radio Service will not increase the present rate of 4 cents per word.

NEW RADIO PUBLICATIONS.

Members of the staff of the radio laboratory of the Bureau of Standards have recently published three papers describing certain apparatus used in investigations in the radio laboratory. These papers have been published in the May (1922) issue of the "Journal of the Optical Society of America and Review of Scientific Instruments."

A paper by R. T. Cox, entitled "Standard Radio Wavemeter, Bureau of Standards Type R70B," describes a standard wavemeter constructed at the Bureau of Standards and used in the standardization of radio apparatus. This instrument has previously been described in this bulletin.

A paper by H. A. Snow, entitled "An Electron Tube Amplifier for Amplifying Direct Current," describes an amplifier of the type indicated by the title which has been developed at the bureau for particular applications in electric signaling work. This amplifier can be used in place of a polarized relay and also for various other purposes, including the recording of telegraphic and radio signals.

A paper by E. L. Hall and J. L. Preston, entitled "High-Voltage Storage Battery for Use With Electron Tube Generators of Radio-Frequency Currents," describes a special type of storage battery developed at the bureau employing a considerable number of small storage cells contained in small glass jars about 1½ inches square and about 4 inches high. These cells are assembled very compactly in trays which can supply 100 volts, and storage batteries of this kind for supplying small currents required for some kinds of electron tube sets may be conveniently assembled to occupy a very small space.—*Submitted by Bureau of Standards.*

CONFERENCE ON RADIO DIRECTION FINDER FOR MARINE USE.

In response to invitations sent by the Bureau of Standards representatives of nine companies interested in the manufacture of radio direction finders met on Friday, May 12, 1922, to confer with the Assistant Secretary of Commerce, the Bureau of Lighthouses, and the Bureau of Standards regarding the production, cost, installation, calibration, and maintenance of radio direction finders on shipboard.

It was announced that the Department of Commerce has decided to install additional radio beacon stations, as follows: Boston, Nantucket, Cape Charles, Columbia River, Puget Sound, and, if funds are still available, Delaware Bay, Los Angeles, and Blunts Reef. These are in addition to the two new radio beacons at Diamond Shoal (off Cape Hatteras) and San Francisco light vessel. Three other radio beacons have

¹ Not reported before as operated by Ship Owners Radio Service.

been in operation in the vicinity of New York harbor for over a year at Ambrose, Fire Island, and Sea Girt.

A considerable number of foreign ships have been equipped with radio direction finders and are calling for radio beacon service as they approach American shores. American shipping companies appreciate the importance of using the radio direction finder on shipboard in order to determine their locations in time of fog and in order to aid in various ways in time of distress at sea.

As a result of the conference arrangements will be made through the Bureau of Lighthouses, between the manufacturers of radio direction finders, and the operators of steamships for the trial and demonstration of radio direction finding equipment under conditions of practice. It is anticipated that with the installation of the additional radio beacon stations and the activity of the manufacturers in the production of direction finders for use on shipboard this method will be adopted very generally as an aid to navigation.—*Submitted by Bureau of Standards.*

INTERNATIONAL UNION OF SCIENTIFIC RADIO TELEGRAPHY.

The International Union of Scientific Radio Telegraphy was organized two years ago for the purpose of furthering, through international cooperation, the systematic study of the fundamental problems of radio communication. Separate sections have been formed for a number of different countries, and the work of the American section has been in progress for over a year.

Recently systematic measurements have been made at receiving stations in the United States of the intensity of signals received from various French stations, and by a continuance of these measurements it is expected that more comprehensive knowledge will be obtained of the phenomena of radio transmission.

A meeting of the American section was held very recently, at which various committees reported, including the committees on the study of radio wave intensity, atmospheric disturbances, variations of radio wave direction, measurements of radiations which cause interference, and electron tubes. Particularly in the case of measurements of the intensity of radio waves, it is important that international cooperation be promoted, since it is only by frequent simultaneous measurements made cooperatively by widely separated sending and receiving stations that accurate results may be obtained.—*Submitted by Bureau of Standards.*

IMPORTANT RADIO PUBLICATIONS.

The following publications are now available at the office of Superintendent of Documents, Government Printing Office, Washington, D. C.:

Amateur radio stations of United States, edition of June 30, 1921. 203 pages. 15 c. (C 11.7/6:921/2).

Antenna resistance. 1912. (Standards Reprint 189.) 5 c. (C 13.3/a:189).

Commercial and Government radio stations of United States, edition of June 30, 1921. 102 pages. 15 c. (C 11.7/6:921/1).

Commercial traffic regulations. 1918. 214 pages, illus., map. Cloth, \$1. (N 22.2:C73/2).

Construction and operation of a simple homemade radio receiving outfit. 1922. 16 pages, illus. (Standards Circular 120.) 5 c. (C 13.4:120).

Elementary electricity. 1921. 52 pages, illus. (Signal Office, Training Pamphlet 1.) 15 c. (W 42.31:1/3).

Elementary principles of radio telegraphy and telephony. 1922. 79 pages, illus. (Radio Communication Pamphlet 1.) 10 c. (W 42.29:1/5).

High-frequency ammeters. 1913. (Standards Reprint 206.) 10 c. (C 13.3/a:206).

Note on resistance of radiotelegraphic antennas. 1915. (Scientific Papers 257.) 5 c. (C 13.3/a:257).

Operation of the modulator tube in radio telephone sets. (Standards Scientific Papers 423.) 10 c. (C 13.3/a:423).

Principles of radio transmission and reception with antenna and coil aerials. (Scientific Papers 354.) 10 c. (C 13.3/a:354).

Principles underlying radio communication. 1922. 619 pages, illus. (Radio. Communication Pamphlet 40.) \$1. (W 42.29:40).

Quantitative experiments in radiotelegraphic transmission. 1914. (Scientific Papers 226.) 5 c. (C 13.3/a:226).

Radio Communication laws of United States and the international radiotelegraphic convention, regulations governing radio operators and the use of radio apparatus on ships and on land. Edition of August 15, 1919. 102 pages. 15 c. (C 11.7/5:919).

Radio direction finder and its application to navigation. (Standards Scientific Papers 428.) 15 c. (C 13.3/a:428).

Radio instruments and measurements. (Standards Circular 74.) 60 c. (C 13.4:74).

Some quantitative experiments in long distance radiotelegraphy. 1911. (Standards Reprint 159.) 10 c. (C 13.3/a:159).

Radio Service Bulletin. Monthly. 5 c. a single copy; 25 c. a year: foreign subscription, 40 c. a year. Supplementary to Radio Stations of United States which is published once a year. (C 11.7/3:).

Remittances should be made to the Superintendent of Documents, Government Printing Office, Washington, D. C., by coupons, postal money order, express order, or New York draft. If currency is sent it will be at sender's risk. Foreign orders should be accompanied by international money order or New York draft.

DISTRIBUTION OF WEATHER INFORMATION, ETC., BY NAVAL RADIO STATIONS.

The Weather Bureau, Department of Agriculture, recently published pamphlets explaining the method of transmitting weather reports, forecasts, and warnings by naval radio stations for the benefit of marine interests. These publications may be obtained from the above-named bureau upon application.

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters), alphabetically by call letters.

Call signal.	Owner of station.	Location of station.	Wave lengths.
KDKA	Westinghouse Electric & Manufacturing Co.	East Pittsburgh, Pa.	360
KDN	Leo J. Meyberg Co.	San Francisco, Calif., California and Mason Streets.	360, 485
KDPT	Southern Electrical Co.	San Diego, Calif., Third and E Streets.	360
KDYL	Telegram Publishing Co.	Salt Lake City, Utah.	360
KDYM	Savoy Theater.	San Diego, Calif., 236 C Street.	360
KDYN	Great Western Radio Corp.	Redwood City, Calif.	360
KDYO	Carlson & Simpson.	San Diego, Calif., Union and C Streets.	360
KDYQ	Oregon Institute of Technology.	Portland, Oreg.	485
KDYR	Pasadena Star-News Publishing Co.	Pasadena, Calif.	360
KDYS	The Tribune.	Great Falls, Mont.	360
KDYU	Herald Publishing Co.	Klamath Falls, Oreg.	360
KDYV	Cope & Cornwell Co.	Salt Lake City, Utah, 1138 Michigan Avenue.	360
KDYW	Smith, Hughes & Co.	Phoenix, Ariz., Third Avenue and Jefferson Street.	360
KDYY	Star Bulletin.	Honolulu, Hawaii.	360
KDYZ	Rocky Mountain Radio Corp.	Denver, Colo., 1512 Broadway.	360
KDZA	Arizona Daily Star.	Tucson, Ariz.	360
KDZB	Frank E. Siefert.	Bakersfield, Calif., 1402 Twentieth Street.	360
KDZD	W. R. Mitchell.	Los Angeles, Calif., 729 South Broadway.	360
KDZE	The Rhodes Co.	Seattle, Wash., 1321 Second Avenue.	360
KDZF	Automobile Club of Southern California.	Los Angeles, Calif., 260 Figueroa.	360
KDZG	Cyrus Peirce & Co.	San Francisco, Calif., 433 California Street.	360.
KDZH	Fresno Evening Herald.	Fresno, Calif.	360
KDZI	Electric Supply Co.	Wenatchee, Wash.	360
KDZJ	Excelsior Radio Co.	Eugene, Oreg., Box 33.	360
KDZK	Nevada Machinery & Electric Co.	Reno, Nev.	360

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters), alphabetically by call letters—Continued.

Call signal.	Owner of station.	Location of station.	Wave lengths.
KDZL	Rocky Mountain Radio Corp.	Ogden, Utah, 2311 Washington Avenue.	360
KDZM	E. A. Hollingworth.	Centralia, Wash., 203 North Tower Avenue.	360
KDZP	Newbery Electric Corp.	Los Angeles, Calif., 724 South Olive Street.	360
KDZQ	Motor Generator Co.	Denver, Colo., 429 South Sherman Street.	360
KDZR	Bellingham Publishing Co.	Bellingham, Wash.	360
KFC	Northern Radio & Electric Co.	Seattle, Wash., 418 Union Street.	360
KFI	Earle C. Anthony (Inc.)	Los Angeles, Calif., Tenth and Hope Streets.	360
KFU	The Precision Shop.	Gridley, Calif., Sycamore Street.	360
KFV	Foster-Bradbury Radio Store.	Yakima, Wash., Herald Block.	360
KFZ	Doerr-Mitchell Electric Co.	Spokane, Wash., 118-120 Lincoln Street.	360
KGB	Wm. A. Mullins Electric Co.	Tacoma, Wash., 1130 Broadway.	360
KGC	Electric Lighting Supply Co.	Hollywood, Calif., 51184 Harold Way.	360
KGF	Pomona Fixture & Wiring Co.	Pomona, Calif., 310 West Second Street.	360
KGG	Hallock & Watson Radio Service.	Portland, Ore., 192 Park Street.	360
KGN	Northwestern Radio Manufacturing Co.	Portland, Ore., 1556 East Taylor Street.	360
KGO	Altadena Radio Laboratory.	Altadena, Calif., 2940 Malden Lane.	360
KGU	Marion A. Mulroney.	Honolulu, Hawaii, Walkiki Beach.	360
KGW	Oregonian Publishing Co.	Portland, Ore., Sixth and Alder Streets.	360
KGY	St. Martins College (Rev. S. Ruth).	Lacey, Wash.	360
KHD	C. F. Aldrich Marble & Granite Co.	Colorado Springs, Colo., P. O. Box 285.	435
KHJ	C. R. Kierulff & Co.	Los Angeles, Calif., 757 South Los Angeles Street.	360
KHQ	Louis Wasmer.	Seattle, Wash., 419 Thirteenth Avenue.	360
KJC	Standard Radio Co.	Los Angeles, Calif., 1044 South Olive Street.	360
KJJ	The Radio Shop.	Sunnyvale, Calif., 229 Sunnyvale Avenue.	360
KJQ	C. O. Gould.	Stockton, Calif., 615 East Main Street.	360
KJR	Vincent I. Kraft.	Seattle, Wash., 8338 Nineteenth Avenue NE.	360, 435
KJS	Bible Institute of Los Angeles.	Los Angeles, Calif., 536 South Hope Street.	360
KLB	J. J. Dunn & Co.	Pasadena, Calif., 1295 East Villa Street.	360
KLN	Noggle Electric Works.	Del Monte, Calif.	360
KLP	Collin B. Kennedy Co.	Los Altos, Calif., O'Keefe Avenue.	360
KLS	Warner Bros.	Oakland, Calif., 2201 Telegraph Avenue.	360
KLX	Tribune Publishing Co.	Oakland, Calif., Thirteenth and Franklin Streets.	360
KLZ	Reynolds Radio Co.	Denver, Colo., 1534 Glenarm Place.	360, 435
KMC	Lindsay-Weatherill & Co.	Reedley, Calif.	360
KMJ	San Joaquin Light & Power Corp.	Fresno, Calif., H and Tulare Streets.	360
KMO	Love Electric Co.	Tacoma, Wash., 732 Pacific Avenue.	360
KNI	T. W. Smith.	Eureka, Calif., Humboldt National Bank Building.	360
KNJ	Roswell Public Service Co.	Roswell, N. Mex., 112 West Third Street.	360, 435
KNN	Bullock's.	Los Angeles, Calif., Seventh and Broadway.	360
KNR	Beacon Light Co.	Los Angeles, Calif., 636 South Hill Street.	360
KNT	North Coast Products Co.	Aberdeen, Wash., 913 West Hume Street.	360
KNV	Radio Supply Co.	Los Angeles, Calif., 815 South Main Street.	360
KNX	Electric Lighting Supply Co.	Los Angeles, Calif., 216 West Third Street.	360
KOA	Young Men's Christian Association.	Denver, Colo., Lincoln Street and Sixteenth Avenue.	435
KOB	New Mexico College of Agriculture and Mechanic Arts.	State College, N. Mex.	360, 435
KOE	Spokane Chronicle.	Spokane, Wash.	360
KOG	Western Radio Electric Co.	Los Angeles, Calif., Seventh and Grand Streets.	360
KOJ	University of Nevada.	Reno, Nev.	360
KON	Holzwasser (Inc.).	San Diego, Calif., Fifth and Broadway.	360
KOP	Detroit Police Department.	Detroit, Mich.	360
KOQ	Modesto Evening News.	Modesto, Calif.	360
KPO	Hale Bros.	San Francisco, Calif., Fifth and Market Streets.	360
KQI	University of California.	Berkeley, Calif.	360
KQL	Arno A. Kluge.	Los Angeles, Calif., 1045 South Bixel Street.	360
KQP	Blue Diamond Electric Co.	Hood River, Oreg., 308 Cascade Avenue.	360, 435
KQT	Electric Power & Appliance Co.	Yakima, Wash., 17 North Second Street.	360
KQV	Doubleday-Hill Electric Co.	Pittsburgh, Pa., 719 Liberty Avenue.	360
KQW	Charles D. Herrold.	San Jose, Calif., 467 First Street.	360
KQY	Stubbs Electric Co.	Portland, Oreg., 75 Sixth Street.	360
KRE	Maxwell Electric Co.	Berkeley, Calif., 3100 Adeline Street.	360
KSC	O. A. Hale & Co.	San Jose, Calif.	360
KSD	Post Dispatch.	St. Louis, Mo.	360
KSL	The Emporium.	San Francisco, Calif.	360
KSS	Prest & Dean Radio Research Laboratory.	Long Beach, Calif., 18 Elm Avenue.	360
KTW	First Presbyterian Church.	Seattle, Wash., Seventh Avenue and Spring Street.	360
KUO	Examiner Printing Co.	San Francisco, Calif.	360, 435
KUS	City Dye Works & Laundry Co.	Los Angeles, Calif., 3000 Central Avenue.	360
KUY	Coast Radio Co.	El Monte, Calif.	360
KVQ	J. C. Hobrecht.	Sacramento, Calif., 915 Seventh Street.	360
KWG	Portable Wireless Telephone Co.	Stockton, Calif., 530 East Market Street.	360

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters), alphabetically by call letters—Continued.

Call signal.	Owner of station.	Location of station.	Wave lengths.
KWH	Los Angeles Examiner.....	Los Angeles, Calif.....	360
KXD	Herald Publishing Co.....	Modesto, Calif., City Hall.....	360
KXS	Braun Corp.....	Los Angeles, Calif., 363 New High Street.....	360
KYF	Thearle Music Co.....	San Diego, Calif., 640 Broadway.....	360
KYG	Willard P. Hawley, Jr.....	Portland, Oreg., 400 East Twenty-second Street North.....	360
KYI	Alfred Harrell.....	Bakersfield, Calif., 1925 I Street.....	360
KYJ	Leo J. Meyberg Co.....	Los Angeles, Calif., Eighth Street and Broadway.....	360, 485
KYW	Westinghouse Electric & Manufacturing Co.....	Chicago, Ill., 72 West Adams Street.....	360, 485
KYY	The Radio Telephone Shop.....	San Francisco, Calif., 175 Steuart Street.....	360
KZC	Public Market & Market Stores Co.....	Seattle, Wash., 1429 First Avenue.....	360
KZI	Irving S. Cooper.....	Los Angeles, Calif., 2041 Argyle Avenue.....	360
KZM	Preston D. Allen.....	Oakland, Calif., Thirteenth and Harrison Streets.....	360
KZN	The Deseret News.....	Salt Lake City, Utah.....	360, 485
KZV	Wenatchee Battery & Motor Co.....	Wenatchee, Wash.....	360
KZY	Atlantic-Pacific Radio Supplies Co.....	Oakland, Calif., 6003 Ocean View Drive.....	360
W.			
WAAB	Times-Picayune.....	New Orleans, La.....	360
WAAC	Tulane University.....	do.....	360
WAAD	Ohio Mechanic's Institute.....	Cincinnati, Ohio.....	360
WAAE	St. Louis Chamber of Commerce.....	St. Louis, Mo.....	360
WAAF	Union Stock Yards & Transit Co.....	Chicago, Ill.....	360, 485
WAAG	Elliott Electric Co.....	Shreveport, La., 517 Spring Street.....	360
WAAH	Commonwealth Electric Co.....	St. Paul, Minn., 182 East Sixth Street.....	360
WAAJ	Eastern Radio Institute.....	Boston, Mass., 899 Boylston Street.....	360
WAAK	Gimbel Bros.....	Milwaukee, Wis.....	360
WAAL	Minnesota Tribune Co. & Anderson-Beamish Co.....	Minneapolis, Minn., 54 South Fourth Street.....	360
WAAM	I. R. Nelson Co.....	Newark, N. J., Bond Street.....	360
WAAN	University of Missouri.....	Columbia, Mo.....	360
WAAO	Radio Service Co.....	Charlestown, W. Va., 1019 Quarrier Street.....	360
WAAP	Otto W. Taylor.....	Wichita, Kans., 441 North Roosevelt Avenue.....	360
WAAQ	New England Motor Sales Co.....	Greenwich, Conn., 22 West Putnam Avenue.....	360
WAAR	Groves-Thornton Hardware Co.....	Huntington, W. Va., 822 Fourth Avenue.....	360
WAAS	Georgia Radio Co.....	Deatur, Ga., 38 Peachtree Street.....	360
WAAV	Athens Radio Co.....	Athens, Ohio, Box 282.....	360
WAAW	Omaha Grain Exchange.....	Omaha, Nebr.....	360
WAAZ	Radio Service Corp.....	Crafton, Pa., 35 Haldane Street.....	360
WAAZ	Yahrline-Rayner Piano Co.....	Youngstown, Ohio, 254 West Federal Street.....	360
WAAZ	Hollister-Miller Motor Co.....	Emporia, Kans., 14 East Sixth Avenue.....	360
WAAZ	Midland Refining Co.....	El Dorado, Kans., 300 South Main Street.....	360, 485
WBAA	Purdue University.....	West Lafayette, Ind.....	360
WBAB	Andrew J. Potter.....	Syracuse, N. Y., 213 Westminster Street.....	360
WBAD	Sterling Electric Co. and Journal Printing Co.....	Minneapolis, Minn., 31 South Fifth Street.....	360
WBAE	Bradley Polytechnic Institute.....	Peoria, Ill.....	360, 485
WBAF	Fred M. Middleton.....	Moorestown, N. J., 337 Chester Avenue.....	360
WBAJ	Diamond State Fibre Co.....	Bridgeport, Pa., Ford Street.....	360, 485
WBAH	The Dayton Co.....	Minneapolis, Minn., Seventh Street and Nicollet Avenue.....	360
WBAJ	Marshall-Gerken Co.....	Toledo, Ohio, 27 Ontario Street.....	360
WBAM	I. B. Rennyson.....	New Orleans, La., 1452 Verna Street.....	360
WBAN	Wireless Phone Corporation.....	Paterson, N. J., 193 Ellison Street.....	360
WBAP	James Millikin University.....	Deatur, Ill.....	360
WBAP	Wortham-Carter Publishing Co. (Star-Telegram).....	Fort Worth, Tex., 400 West Seventh Street.....	360, 485
WBAQ	Myron L. Harmon.....	South Bend, Ind., Room 364, Y. M. C. A.....	360
WBAU	Republican Publishing Co.....	Hamilton, Ohio, Third and Market Streets.....	360
WBAV	Erner & Hopkins Co.....	Columbus, Ohio, 146 North Third Street.....	360
WBAW	Marietta College.....	Marietta, Ohio.....	360
WBAZ	John H. Stenger, Jr.....	Wilkes-Barre, Pa., 66 Gildersleeve Street.....	360
WBAZ	American Telephone & Telegraph Co.....	New York, N. Y., 24 Walker Street.....	360
WBAZ	Times-Dispatch Publishing Co.....	Richmond, Va.....	360
WBT	T. & H. Radio Co.....	Anthony, Kans., 401 South Anthony Street.....	360
WBL	D. W. May (Inc.).....	Newark, N. J., 178 Central Avenue.....	360
WBT	Southern Radio Corp.....	Charlotte, N. C., 905 Realty Building.....	360, 485
WBU	City of Chicago.....	Chicago, Ill.....	360
WBZ	Westinghouse Electric & Manufacturing Co.....	Springfield, Mass.....	360
WCAB	Newburgh News Printing & Publishing Co.....	Newburgh, N. Y., 40 Grand Street.....	360
WCAC	John Fink Jewelry Co.....	Fort Smith, Ark., 701 Garrison Avenue.....	360
WCAD	St. Lawrence University.....	Canton, Ohio.....	360
WCAE	Kaufman & Baer Co.....	Pittsburgh, Pa., Sixth and Smithfield Streets.....	360
WCAE	Daily States Publishing Co.....	New Orleans, La., 606 Canal Street.....	360

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters), alphabetically by call letters—Continued.

Call signal.	Owner of station.	Location of station.	Wave lengths.
WOAH	Entrekin Electric Co.	Columbus, Ohio.	360
WCAJ	Nebraska Wesleyan University	University Place, Nebr.	360, 485
WCAK	Alfred P. Daniel	Houston, Tex., 2504 Bagby Street	360
WCAL	St. Olaf College	Northfield, Minn.	360
WCAM	Villanova College	Villanova, Pa.	360
WCAN	Southeastern Radio Telephone Co.	Atlantic National Bank Building	360
WCAO	Sanders & Stayman Co.	Baltimore, Md., 319 North Charles Street	360
WCAP	Central Radio Service	Decatur, Ill., 211 Main Street	360
WCAQ	Tri-State Radio Manufacturing & Supply Co.	Defiance, Ohio, 309 Clinton Street	360
WCAR	Alamo Radio Electric Co.	San Antonio, Tex., 608 West Evergreen Street	360
WCAS	Wm. Hood Dunwoody Industrial Institute.	Minneapolis, Minn., 818 Superior Boulevard	360
WCAT	South Dakota School of Mines	Rapid City, S. Dak.	485
WCAU	Philadelphia Radiophone Co.	Philadelphia, Pa., 1836 Market Street	360
WCAV	J. C. Dice Electric Co.	Little Rock, Ark., 113 West Capitol Avenue	360
WCAW	Quincy Herald & Quincy Electric Supply Co.	Quincy, Ill.	360
WCAZ	University of Vermont	Burlington, Vt.	360
WCAY	Kesselman O'Driscoll Co.	Milwaukee, Wis., 517 Grand Avenue	360
WCAZ	Robt. E. Compton & Quincy Whig-General.	Quincy, Ill.	360
WCE	Findley Electric Co.	Minneapolis, Minn., 212 South Fifth Street	360
WCJ	A. C. Gilbert Co.	New Haven, Conn., 493 Blatchley Avenue	360
WCK	Stix-Baer-Fuller	St. Louis, Mo., Washington Street	360
WCM	University of Texas	Austin, Tex.	360, 485
WCN	Clark University	Worcester, Mass.	360, 485
WCX	Detroit Free Press	Detroit, Mich.	360, 485
WDAA	Ward-Belmont School	Nashville, Tenn., Belmont Heights	360
WDAB	H. C. Summers & Son	Portsmouth, Ohio, 908 Gallia Street	360
WDAC	Illinois Watch Co.	Springfield, Ill., Ninth and Grand Avenue	485
WDAD	Wm. L. Harrison	Lindsborg, Kans., 122 East Lincoln Street	360
WDAE	Tampa Daily Times	Tampa, Fla.	360, 485
WDAF	Kansas City Star	Kansas City, Mo.	360
WDAG	J. Laurance Martin	Amarillo, Tex., 605 East Fourth Street	360
WDAH	Mine & Smelter Supply Co.	El Paso, Tex., 412 San Francisco Street	360
WDAI	Hughes Electrical Corp.	Syracuse, N. Y., 411 South Clinton Street	360
WDAJ	Atlanta & West Point R. R. Co.	College Park, Ga.	360
WDAK	The Courant	Hartford, Conn.	360
WDAL	Florida Times-Union	Jacksonville, Fla.	360, 485
WDAN	Glenwood Radio Corp.	Shreveport, La., Centenary College	360
WDAO	Automotive Electric Co.	Dallas, Tex., Erway & Corsicana Street	360
WDAP	Mid West Radio Central Inc.	Chicago, Ill., Wrigley Building	360
WDAQ	Hartman-Riker Electric and Machine Co.	Brownsville, Pa., 312 Market Street	360
WDAR	Lat Bros.	Philadelphia, Pa.	360
WDAS	Samuel A. Waite	Worcester, Mass., 49 Benefit Street	360
WDAT	Delta Electric Co.	Worcester, Mass., 658 Main Street	360
WDAU	Slocum & Kilburn	New Bedford, Mass., 23 North Water Street	360
WDAV	Muskogee Daily Phoenix	Muskogee, Okla.	360
WDAX	Georgia Railway & Power Co.	Atlanta, Ga.	360, 485
WDAY	First National Bank	Centerville, Iowa	360
WDM	Kenneth M. Hance	Fargo, N. Dak., 117 Broadway	360, 485
	Church of the Covenant	Washington, D. C., Eighteenth & N Streets NW.	360
WDT	Ship Owners Radio Service	New York, N. Y., 80 Washington Street	360
WDV	John O. Yelser, Jr.	Omaha, Nebr., 5022 Cass Street	360
WDY	Radio Corporation of America	Roselle Park, N. J.	360
WDZ	James L. Bush	Tuscola, Ill., Star Store Building	360
WEAA	Fallain & Lathrop	Flint, Mich., 104 Walsh Building	360
WEAB	Standard Radio Equipment Co.	Fort Dodge, Iowa, 619 Carver Building	360
WEAC	Baines Electric Service Co.	Terre Haute, Ind., 24 South Eighth Street	360
WEAD	Northwest Kansas Radio Supply Co.	Atwood, Kans.	360
WEAE	Virginia Polytechnic Institute	Blacksburg, Va.	360
WEAF	Western Electric Co.	New York, N. Y., 463 West Street	360
WEAG	Nichols-Hineline-Bassett Laboratory	Edgewood, R. I., 94 Armington Street	360
WEAH	Wichita Board of Trade & Lander Radio Co.	Wichita, Kans.	360, 485
WEAI	Cornell University	Ithaca, N. Y.	360
WEAJ	University of South Dakota	Vermillion, S. Dak.	360
WEAK	Julius B. Abercrombie	St. Joseph, Mo., 819 North Twenty-third Street	360
WEAM	Borough of North Plainfield	North Plainfield, N. J.	360
WEAW	Arrow Radio Laboratories	Anderson, Ind., Box 140	360
WEB	Benwood Co.	St. Louis, Mo., 1110 Olive Street	360
WEV	Hurlburt-Still Electrical Co.	Houston, Tex., McKinney Avenue and San Jacinto Street	360, 485
WEW	St. Louis University	St. Louis, Mo.	360, 485

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters), alphabetically by call letters—Continued.

Call signal.	Owner of station.	Location of station.	Wave lengths.
WEY	Cosradio Co.	Wichita, Kans., 1725 Fairmont Avenue.	360, 485
WFI	Strawbridge & Clothier.	Philadelphia, Pa., Eighth and Market Streets.	360
WFO	Rike-Kumler Co.	Dayton, Ohio, Main and Second Streets.	360, 485
WGF	The Register & Tribune.	Des Moines, Iowa.	360
WGH	Montgomery Light & Power Co.	Montgomery, Ala.	360, 485
WGI	American Radio Research Corp.	Medford Hillside, Mass.	360
WGL	Thomas F. J. Howlett.	Philadelphia, Pa., 2303 North Broad Street.	360
WGU	Federal Telephone & Telegraph Co.	Buffalo, N. Y., 1738 Elmwood Avenue.	360, 485
WGV	The Fair.	Chicago, Ill.	360
WGY	Interstate Electric Co.	New Orleans, La., 356 Barrone Street.	360
WHA	General Electric Co.	Schenectady, N. Y.	360
WHB	University of Wisconsin.	Kansas City, Mo., Sweeney Building.	360, 485
WHC	Sweeney School Co.	Morgantown, W. Va.	360
WHH	West Virginia University.	Cleveland, Ohio, 1965 East Sixty-sixth Street.	360
WHK	Warren R. Cox.	Ridgewood, N. Y., Chamber of Commerce Building.	360
WHN	Ridgewood Times Printing & Publishing Co.	Rochester, N. Y.	360, 485
WHQ	Rochester Times Union.	Toledo, Ohio, 224 Superior Street.	360
WHU	Wm. B. Duck Co.	East Lansing, Mich., local office U. S. Weather Bureau.	485
WHW	Stuart W. Seeley.	McKeesport, Pa., 427 Olive Street.	360
WIK	K. & L. Electric Co.	Washington, D. C., 808 Ninth Street NW.	360
WIL	Continental Electrical Supply Co.	Philadelphia, Pa., Ninth and Market Streets.	360
WIP	Gimbel Bros.	Cincinnati, Ohio, 218 West Twelfth Street.	360, 485
WIZ	Cino Radio Manufacturing Co.	Granville, Ohio.	360
WJD	Richard H. Howe.	Washington, D. C., 812 Thirteenth Street NW.	360
WIH	White & Boyer Co.	Toledo, Ohio, 225 Superior Street.	360
WJK	Service Radio Equipment Co.	Erie, Pa., 703 State Street.	360
WJT	Electric Equipment Co.	New York, N. Y., 1391 Sedgwick Avenue.	360
WJX	De Forest Radio Telephone & Telegraph Co.	Newark, N. J., 95 Orange Street.	360
WJZ	Westinghouse Electric & Manufacturing Co.	Baltimore, Md., 2527 Madison Avenue.	360
WKC	Joseph M. Zamoiski Co.	Memphis, Tenn., 223 South Front Street.	360, 485
WKN	Riesman-Crosby Co.	Oklahoma City, Okla., 1911 West Ash Street.	360, 485
WKY	Oklahoma Radio Shop.	Minneapolis, Minn.	360, 485
WLB	University of Minnesota.	Indianapolis, Ind., 2011 Alabama Street, North.	360, 485
WLK	Hamilton Manufacturing Co.	Cincinnati, Ohio, B. & O. R. R. and Blue Rock Street.	360
WLW	Crosley Manufacturing Co.	Auburn, Me., 67 Court Street.	360
WMB	Auburn Electrical Co.	Youngstown, Ohio, South Avenue and Indianola Street.	360
WMC	Columbia Radio Co.	Cincinnati, Ohio, 2437 Gilbert Avenue.	360, 485
WMH	Precision Equipment Co.	Washington, D. C., 715 Twelfth Street north-west.	360
WMU	Doubleday-Hill Electric Co.	Albany, N. Y., 8 Market Street.	360
WNJ	Shotton Radio Manufacturing Co.	Jersey City, N. J., 997 Bergen Avenue.	360
WNO	Wireless Telephone Co. of Hudson County, N. J.	Davenport, Iowa, 1002 Brady Street.	360, 485
WOC	Palmer School of Chiropractic.	Akron, Ohio, 569 South Main Street.	360
WOE	Buckeye Radio Service Co.	Indianapolis, Ind., 531 North Meridian Street.	360
WOH	Hatfield Electric Co.	Ames, Iowa.	360, 485
WOI	Iowa State College.	Pine Bluff, Ark.	360
WOK	Pine Bluff Co.	Philadelphia, Pa., Thirteenth and Market Streets.	360
WOO	John Wanamaker.	Kansas City, Mo.	360, 485
WOQ	Western Radio Co.	Newark, N. J., 131 Market Street.	360
WOR	L. Bamberger & Co.	Jefferson City, Mo.	485
WOS	Missouri State Marketing Bureau.	Omaha, Neb., 1802 and 3405 Farnam Street.	360, 485
WOU	Metropolitan Utilities District.	Richmond, Ind.	360, 485
WOZ	Palladium Printing Co.	Fort Worth, Tex., Fifth and Throckmorton Streets.	360, 485
WPA	Fort Worth Record.	Kansas City, Mo., 575 Grand Avenue.	360
WPE	Central Radio Co.	New Lebanon, Ohio, R. R. No. 2.	360
WPG	Nushawg Poultry Farm.	Clearfield, Pa., 123 Market Street.	360
WPI	Electric Supply Co.	Philadelphia, Pa., Eighteenth and Thompson Streets.	360
WPJ	St. Joseph's College.	Zanesville, Ohio, 524 Main Street.	360
WPL	Fergus Electric Co.	Washington, D. C., 1324 New York Avenue NW.	360
WPM	Thomas J. Williams.	Memphis, Tenn., 600 Monroe Avenue.	360
WPO	United Equipment Co.	Hamilton, Ohio, 329 North C Street.	360
WRK	Doron Bros. Electric Co.	Schenectady, N. Y.	360
WRL	Union College.	Urbana, Ill.	360
WRM	University of Illinois.	Camden, N. J., Second and Federal Streets.	360
WRP	Federal Institute of Radio Telegraphy.		

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters), alphabetically by call letters—Continued.

Call signal.	Owner of station.	Location of station.	Wave lengths.
WRR	City of Dallas, Police and Fire Signal Department.	Dallas, Tex.	360, 485
WRW	Tarrytown Radio Research Laboratory	Tarrytown, N. Y., 21 North Broadway	360
WSB	Atlanta Journal	Atlanta, Ga.	360, 485
WSL	J. & M. Electric Co.	Utica, N. Y., 26 Bank Place	360
WSN	Ship Owners Radio Service	Norfolk, Va., 519 Granby Street	360
WSV	L. M. Hunter and G. L. Carrington.	Little Rock, Ark., 2420 Ivard Street	360
WSX	Erie Radio Co.	Erie, Pa., 117 West Ninth Street	360
WSY	Alabama Power Co.	Birmingham, Ala., Brown-Marx Building.	360
WTG	Kansas State Agricultural College.	Manhattan, Kans.	485
WTK	Paris Radio Electric Co.	Paris, Tex., 42 South Main Street	360
WTP	George M. McBride	Bay City, Mich., 611 Midland Street	360
WWB	Daily News Printing Co.	Canton, Ohio, 402 Second Street NW	360
WWI	Ford Motor Co.	Dearborn, Mich.	360
WWJ	Detroit News	Detroit, Mich.	360, 485
WWL	Loyola University	New Orleans, La.	360
WWT	McCarthy Bros. & Ford.	Buffalo, N. Y., 75 West Mohawk Street	360
WWZ	John Wanamaker.	New York, N. Y., Eighth Street and Broadway.	360

SUPPLEMENTAL LIST FROM JUNE 1 TO JUNE 15, INCLUSIVE.

KDZU	Western Radio Corp.	Denver, Colo., 737 Lincoln Street.	360
KDZW	Claude W. Gerdes.	San Francisco, Calif., 2198 O'Farrell Street.	360
KDZX	Glad Tidings Tabernacle	San Francisco, Calif., 1536 Ellis Street.	360
KDZZ	Kinney Bros. & Sipprell.	Everett, Wash., 1705 Hewitt Avenue.	360
KFAB	Pacific Radiofone Co.	Portland, Oreg., 108 North Broadway.	360
WEAN	Shepard Co.	Providence, R. I.	360
WEAO	Ohio State University.	Columbus, Ohio.	360, 485
WEAP	Mobile Radio Co.	Mobile, Ala., O'Gwinn Building.	360
WEAQ	Young Men's Christian Association.	Berlin, N. H.	360
WEAR	Baltimore American & News Publishing Co.	Baltimore, Md.	360
WEAS	Hecht Co.	Washington, D. C., Seventh and F Streets NW.	360
WEAT	John J. Fogarty.	Tampa, Fla., 707 Azeele Street.	360
WEAU	Davidson Bros. Co.	Sioux City, Iowa.	360
WEAV	Sheridan Electric Service Co.	Rushville, Nebr.	360
WEAX	T. J. M. Daly.	Little Rock, Ark., P. O. Box 614.	360, 485
WEAY	Will Horwitz, Jr.	Houston, Tex., 612 Travis Street.	360
WEAZ	Donald Redmond.	Waterloo, Iowa, 1120 Berich Avenue.	360
WEAA	A. H. Belo & Co.	Dallas, Tex.	360, 485
WFAB	Carl F. Woese.	Syracuse, N. Y., 802 McBride Street.	360
WFAC	Superior Radio Co.	Superior, Wis., 2326 John Avenue.	360
WFAD	Watson Weldon Motor Supply Co.	Salina, Kans., 217 North Santa Fe Street.	360
WFAF	H. C. Spratley Co.	Poughkeepsie, N. Y., 357 Main Street.	360
WFAQ	Radio Engineering Laboratory.	Waterford, N. Y., Sixth and Broad Streets.	360
WFAH	Electric Supply Co.	Port Arthur, Tex., 637 Procter Street.	360
WFAJ	Hi-Grade Wireless Instrument Co.	Asheville, N. C., 47 Zillico Street.	360
WFAK	Domestic Electric Co.	Brentwood, Mo., 908 Pine Street.	360
WFAL	Houston Chronicle Publishing Co.	Houston, Tex.	360, 485
WFAM	Times Publishing Co.	St. Cloud, Minn.	360
WFAN	Hutchinson Electric Service Co.	Hutchinson, Minn.	360, 485
WFAP	Brown's Business College.	Peoria, Ill.	360
WFAQ	Missouri Wesleyan College and Cameron Radio Co.	Cameron, Mo.	330
WFAR	Hall & Stubbs.	Sanford, Me., 1 Bennett Street.	360
WFAS	United Radio Corp.	Fort Wayne, Ind., 107 East Main Street.	360
WFAT	Daily Argus-Leader.	Sioux Falls, S. Dak.	360
WGAB	QRV Radio Co.	Houston, Tex., 1213 Prairie Avenue.	360

Hereafter the only list of broadcasting stations to appear in this publication will be that for those stations that are newly licensed during the month previous to the date of the Bulletin in which the list appears.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, July 1, 1922—No. 63

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name	=Name of station.
Loc.	=Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call	=Call letters assigned.
System	=Radio system used and sparks per second.
Range	=Normal range in nautical miles.
W. l.	=Wave lengths assigned: Normal wave lengths in italics.
Service	=Nature of service maintained: PG=General public. PR=Limited public. RC=Radio compass station. P=Private. O=Government business exclusively.
Hours	=Hours of operation. N=Continuous service. X=No regular hours. m=a. m. (12 m=midday). s=p. m. (12s=midnight).
Rates	=Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co.	=Independent Wireless Telegraph Co.
R. C. of A.	=Radio Corporation of America.
S. O. R. S.	=Ship Owners' Radio Service.
C. w.	=Continuous wave.
I. c. w.	=Interrupted continuous wave.
V. t.	=Vacuum tube.
FX.	=Fixed station.

CERTIFICATE: By direction of the Secretary of Commerce this publication is issued as an administrative report and is required for the proper transmission of the public business.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Everett, Wash. ¹	KFT	300, 440, 550, 600	PG	N	American Tugboat Co.
Tulsa, Okla. ²	WEH	360, 485, 1610	PR (FX)	X	Midland Refining Co.

¹ Loc. O. 122° 15' 00" N. 48° 00' 00"; range, 300; system, Kilbourne & Clark, 1000; rates, ship service, 10 c. per word (approximately).

² Loc. (approximately) O. 51° 29' 00" N. 35° 20' 00"; range, 150; system, composite (v. t., telephone, and telegraph); rates, none.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.		Service.	Hours.	Owner of vessel.	Station controlled by—
		North and South American service.	Trans-oceanic service.				
		<i>Cents.</i>	<i>Cents.</i>				
Alberta.....	KFAK						
Bayonne.....	KFAG	8	8	PG	X	Vacuum Oil Co.....	R. C. of A.
Dolly C.....	KFAL			PG	X	Cary Davis Tug & Barge Co.	
G. S. Allyn ¹	KDZY			PR	X	C. E. Davis Packing Co.	Owner of vessel.
Guarina.....	KDZS					P. E. Fansler.....	
Hamilton.....	KFAM			PG	X	Old Dominion Transportation Co.	
Missourian.....	KFAA	8	8	PG	X	American-Hawaiian S. S. Co.	United American lines.
Pacific.....	KDZV			PG	X	Argonaut S. S. Co.....	
Pilgrim.....	KFAH					William L. Elkins....	

¹ Range, 150; system, Navy-Simon, 1000; w. l., 300, 450, 600; rates, none.

Commercial land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDZS	Guarina.....b	KFAK	Alberta.....b
KDZV	Pacific.....b	KFAL	Dolly C.....b
KDZY	G. S. Allyn.....b	KFAM	Hamilton.....b
KFAA	Missourian.....b	KFT	Everett, Wash.....c
KFAG	Bayonne.....b	WEH	Tulsa, Okla.....c
KFAH	Pilgrim.....b		

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters), alphabetically by call letters.

Call signal.	Station operated and controlled by—	Location of station.	Wave lengths.
KDZW	Claude W. Gerdes.	San Francisco, Calif., 2198 O'Farrell St.	360
KDZZ	Glad Tidings Tabernacle	San Francisco, Calif., 1536 Ellis St.	360
KDZZ	Kinney Bros. & Sipprell	Everett, Wash., 1705 Hewitt Ave.	360
KFAB	Pacific Radiofone Co.	Portland, Oreg., 108 N. Broadway	360
KFAC	Glendale Daily Press	Glendale, Calif., 222 S. Brand Boulevard	360
KFAD	McArthur Bros. Mercantile Co.	Phoenix, Ariz., 134 S. Central St.	360
KFAE	State College of Washington	Pullman, Wash.	360
KFAF	Western Radio Corp.	Denver, Colo., 737 Lincoln St.	360
KFAJ	University of Colorado	Boulder, Colo.	360
WEAN	Shepard Co.	Providence, R. I.	360
WEAO	Ohio State University	Columbus, Ohio	360, 485
WEAP	Mobile Radio Co.	Mobile, Ala., O'Gwinn Building	360
WEAQ	Young Men's Christian Association	Berlin, N. H.	360
WEAR	Baltimore American & News Publishing Co.	Baltimore, Md., Munsey Building	360
WEAS	Hecht Co.	Washington, D. C., Seventh and F Sts. NW	360
WEAT	John J. Fogarty	Tampa, Fla., 707 Azeele St.	360
WEAU	Davidson Bros. Co.	Sioux City, Iowa	360
WEAV	Sheridan Electric Service Co.	Rushville, Nebr.	360
WEAX	T. J. M. Daly	Little Rock, Ark., P. O. Box 614	360, 485
WEAY	Will Horwitz, Jr.	Houston, Tex., 612 Travis St.	360
WEAZ	Donald Redmond	Waterloo, Iowa, 1120 Berthel Ave.	360
WEH	Midland Refining Co.	Tulsa, Okla., 300 S. Main St., Eldorado, Kans.)	360, 485
WFAA	A. H. Belo & Co.	Dallas, Tex.	360, 485
WFAB	Carl F. Woese	Syracuse, N. Y., 802 McBride St.	360
WFAC	Superior Radio Co.	Superior, Wis., 2326 John Ave.	360
WFAD	Watson Weldon Motor Supply Co.	Salina, Kans., 217 N. Santa Fe St.	360
WFAP	H. C. Spratley Co.	Poughkeepsie, N. Y., 357 Main St.	360
WFAH	Radio Engineering Laboratory	Waterford, N. Y., Sixth and Broad Sts.	360
WFAI	Electric Supply Co.	Port Arthur, Tex., 637 Frocter St.	360
WFAJ	Hi-Grade Wireless Instrument Co.	Asheville, N. C., 47 Zillioea St.	360
WFAK	Domestic Electric Co.	Brentwood, Mo., 908 Pine St.	360
WFAL	Houston Chronicle Publishing Co.	Houston, Tex.	360, 485
WFAM	Times Publishing Co.	St. Cloud, Minn.	360
WFAN	Hutchinson Electric Service Co.	Hutchinson, Minn.	360, 485
WFAP	Brown's Business College	Peoria, Ill.	360
WFAQ	Missouri Wesleyan College and Cameron Radio Co.	Cameron, Mo.	360
WFAW	Hall & Stubbs	Sanford, Me., 1 Bennett St.	360
WFAS	United Radio Corp.	Fort Wayne, Ind., 107 E. Main St.	360
WFAU	Daily Argus-Leader	Sioux Falls, S. Dak., 109 N. Main Ave.	360
WFAV	Edwin C. Lewis	Boston, Mass., 121 Federal St.	360
WFAW	University of Nebraska, department of electrical engineering.	Lincoln, Nebr.	360, 485
WFAW	Miami Daily Metropolis	Miami, Fla.	360
WFAZ	Arthur L. Kent	Binghamton, N. Y., 199 Court St.	360
WFAZ	Daniels Radio Supply Co.	Independence, Kans.	360
WFAZ	South Carolina Radio Shop	Charleston, S. C.	360
WGAB	Q R V Radio Co.	Houston, Tex., 1213 Prairie Ave.	360
WGAC	Orpheum Radio Stores Co.	Brooklyn, N. Y., 637 Fulton St.	360
WGAD	Spanish-American School of Radiotelegaphy	Ensenada, P. R.	360
WGAF	Goller Radio Service	Tulsa, Okla., 20 E. Eleventh St.	360
WGAH	New Haven Electric Co.	New Haven, Conn., 296 Elm St.	360
WGAJ	W. H. Gass	Shenandoah, Iowa, 413 Seventh Ave.	360
WGAJ	Macon Electric Co.	Macon, Ga.	360
WGAL	Lancaster Electric Supply & Construction Co.	Lancaster, Pa., 23 E. Orange St.	360
WGAM	Orangeburg Radio Equipment Co.	Orangeburg, S. C.	360
WGAN	Cecil E. Lloyd	Pensacola, Fla., 216 W. Romana St.	360
WGAQ	W. G. Patterson (Glenwood Radio Corp.)	Shreveport, La.	360
WGAR	Southwest American	Fort Smith, Ark., 507 Rogers Ave.	360
WGBS	Ray-Di-Co Organization	Chicago, Ill., 1547 N. Wells St.	360
WGAT	American Legion, Department of Nebraska	Lincoln, Nebr., 314 Richards Block	360
WGAU	Marcus G. Limb	Wooster, Ohio, 235 E. Liberty St.	360
WGAU	B-H Radio Co.	Savannah, Ga., 204 W. Broughton St.	360
WGAU	Ernest C. Albright	Altoona, Pa., 1918 W. Chestnut St.	360
WGAU	North Western Radio Co.	Madison, Wis., 250 State St.	360
WGAZ	South Bend Tribune	South Bend, Ind.	360
WHAA	State University of Iowa	Iowa City, Iowa	360
WHAB	Clark W. Thompson (Fellman's Dry Goods Co.)	Galveston, Tex.	360, 485
WHAC	Cole Bros. Electric Co.	Waterloo, Iowa	360
WHAD	Marquette University	Milwaukee, Wis.	360
WHAE	Automotive Electric Service Co.	Sioux City, Iowa	360
WHAF	Radio Electric Co.	Pittsburgh, Pa.	360

Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Cuba.....	WYCA	U. S. Army.
Discoverer.....	NIJT	U. S. Coast and Geodetic Survey.
Marinduque.....	NIGV	Do.
Pioneer.....	NIJL	Do.

Government land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NIGV	Marinduque.....b	NIJT	Discoverer.....b
NIJL	Pioneer.....b	WYCA	Cuba.....b

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921.]

Station.	Call signal.	Wave lengths.	Station controlled by—
Ablene, Tex.	5ZAX	200, 375	Eugene W. Wood, 340 Butternut Street.
Atlanta, Ga.	4XI	200, 275	Technological High School.
Belmar, N. J.	2XAO	Variable	Radio Corporation of America, 233 Broadway, New York, N. Y.
Dallas, Tex.	5ZAY	200, 375	A. H. Pelo & Co.
Delanco, N. J.	3XP	250	Henry M. Neely.
Fayetteville, Ark.	5ZAZ	200, 375	Lawrence W. Stinson, 354 North West Street.
Great Neck, N. Y.	2XAN	Variable	Harry Alexander, 20 West Thirty-fourth Street, New York, N. Y.
Madison, Wis.	9XL	360	North Western Radio Co., 250 State Street.
Mobile, Ala.	5XAE	200, 375	Mobile Radio Co., O'Gwinn Building.
New Brunswick, N. J.	2XAM	Variable	Radio Corporation of America, 233 Broadway, New York, N. Y.
Oklahoma City, Okla.	5XAF	200, 375	Roswell B. Downing.
Orange, Tex.	5XAD	Variable	Gray & Gray.
Philadelphia, Pa.	3XAG	200, 250	Westinghouse Electric & Manufacturing Co., 214 North Twenty-second Street.
Pittsburgh, Pa.	8XW	Variable	Radio Electric Co., 1427 Liberty Avenue.
Pittsburgh, Pa.	8XX	200, 375	Duquesne University.
San Francisco, Calif.	6XAU	Variable	Wilson McGuire Co., 1004 Treat Avenue.
Tampa, Fla.	4XJ	285, 325	Thompson Electric Co., 182 West Lafayette Street.
Washington, D. C.	3XO	200, 375	Central High School.
Waterbury, Conn.	1XT	360	Bristol Co.
Winthrop, Mass.	1XQ	Variable	Lloyd C. Greene, 88 Somerset Avenue.
Worcester, Mass.	1XS	do.....	Otis C. White, 17 Herman Street.

Special land stations, grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
1XQ	First district:		Fifth district:
1XS	Winthrop, Mass.	5XAD	Orange, Tex.
1XT	Worcester, Mass.	5XAE	Mobile, Ala.
	Waterbury, Conn.	5XAF	Oklahoma City, Okla.
	Second district:	5ZAX	Ablene, Tex.
2XAM	New Brunswick, N. J.	5ZAY	Dallas, Tex.
2XAN	Great Neck, N. Y.	5ZAZ	Fayetteville, Ark.
2XAO	Belmar, N. J.	6XAU	Sixth district: San Francisco, Calif.
	Third district:		Eighth district:
3XAG	Philadelphia, Pa.	8XX	Pittsburgh, Pa.
3XO	Washington, D. C.	8XW	Do.
3XP	Delanco, N. J.	9XL	Ninth district: Madison, Wis.
	Fourth district:		
4XI	Atlanta, Ga.		
4XJ	Tampa, Fla.		

ALTERATIONS AND CORRECTIONS.**COMMERCIAL LAND STATIONS.**

- BOSTON, MASS.**—Loc. O. $71^{\circ} 03' 40''$, N. $42^{\circ} 21' 19''$.
DEARBORN, MICH. (KDEN).—System, composite (v. t. telephone).
EAST HAMPTON, N. Y.—Station operated and controlled by I. W. T. Co.
EAST MORICHES, N. Y.—Call changed to WSE.
FALL RIVER MILLS, CALIF.—Strike out all particulars.
HARTFORD, CONN. (WQB).—Strike out all particulars.
HOLLYWOOD, CALIF.—Strike out all particulars.
KAHUKU, HAWAII (KIE).—System, R. C. of A. (Alexanderson alternator and R. C. of A.); spark, 1000; w. l., 9145, 16 975.
MARION, MASS. (WCC).—System, R. C. of A., v. t., c. w., and i. c. w.
NAKNEK, ALASKA (KMK).—Range, 500; w. l., 300, 500, 600, 1800.
NEW LONDON, CONN. (WLC).—System, Navy-Lowenstein, 1000.
NEW YORK, N. Y. (WSE).—Call changed to WBC.
NORTHVILLE, MICH.—System, composite (v. t. telephone); w. l., 425.
PORT HURON, MICH.—Range, 150; system, R. C. of A. (v. t. telephone and telegraph); w. l., 300, 400, 600, 1625.
ROGERS, MICH.—System, U. S. Navy spark, 1000 and composite (v. t., telephone, and telegraph; w. l., 300, 450, 475, 600).
SAN FRANCISCO, CALIF. (KHH).—Range, 150; system, composite (v. t., telephone, and composite); spark, 1000.
SUSANVILLE, CALIF.—Strike out all particulars.
UGASHIK, ALASKA.—Range, 200.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

- A. A. DAUGHERTY.**—Station operated and controlled by I. W. T. Co.
AEOLUS.—Name changed to City of Los Angeles.
ALASKAN.—Station operated and controlled by United American Lines.
AMERICAN.—Station operated and controlled by United American Lines.
ARGOSY.—Range, 300; system, Navy-Liberty, 1000; w. l., 300, 450, 600.
ARIZONAN.—Station operated and controlled by United American Lines.
ASTMAHCO III.—Name changed to Ormidale; Charlton B. Hibbard owner of vessel.
ASTMAHCO IV.—Name changed to Glendaruel; Charlton B. Hibbard owner of vessel.
ATENAS.—United Fruit S. S. Corp. owner of vessel.
BALDRIDGE.—Strike out all particulars.
BARTOLOME.—Strike out all particulars.
BARWICK.—Station operated and controlled by I. W. T. Co.
BASCOBEL.—System, Navy-Wireless Specialty Apparatus Co., 1000.
BAYSPRING.—Strike out all particulars.
BAY STATE.—Name changed to President Madison.
BELLA.—Strike out all particulars.
BETHNOR.—Name changed to Irene; A. H. Bull S. S. Co., owner of vessel.
BONITA.—Strike out all particulars.
BYFIELD.—Strike out all particulars.
CALAMARES.—United Fruit S. S. Corp. owner of vessel.
CALIFORNIAN.—Range, 300; system, Telefunken, 1000; w. l., 300, 450, 600, 1800; station operated and controlled by United American Lines.
CALLAO.—J. H. Mahony owner of vessel.
CAMDEN (KDKL).—United Fruit Tanker Corp. owner of vessel.
CAPE HENRY.—Station operated and controlled by S. O. R. S.
CARL D. BRADLEY.—System, R. C. of A. (v. t., telephone, and R. C. of A.); spark, 1000; w. l., 300, 450, 475, 600.

- CARRILLO.—United Fruit S. S. Corp. owner of vessel.
CARTAGO.—United Fruit S. S. Corp. owner of vessel.
CATHERINE D.—Rates, North and South American and transoceanic services 8 c. per word, effective August 1, next.
CENTRAL AMERICAN.—Strike out all particulars.
CHARLES PRATT.—System, R. C. of A., 1000.
CHESTER W. CHAPIN.—Range, 150; system, Cutting & Washington, 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services 8 c. per word; station operated and controlled by I. W. T. Co.
CLAREMONT.—Hart-Wood Lumber Co., owner of vessel.
CLAVARACK.—W. l., 300, 450, 600.
COCHIN.—Strike out all particulars.
COKESIT.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
COMMONWEALTH.—System, Cutting & Washington, 1000; w. l., 300, 450, 550, 600; rates, North and South American and transoceanic services 8 c. per word; station operated and controlled by I. W. T. Co.
COVERUN.—Fred J. Gauntlett owner of vessel.
COWARDIN.—Strike out all particulars.
COWEE.—Fred J. Gauntlett, owner of vessel.
COWICHE.—W. l., 300, 450, 600; California and Oregon Lumber Co. owner of vessel; station operated and controlled by S. O. R. S.
CRAIGSMERE.—Morton Salt Co. owner of vessel.
DAKOTAN.—Station operated and controlled by United American Lines.
DELPHINE (KIFL).—Name changed to Stellaris; Stellar F. Schlotman owner of vessel.
DELROSA.—Station operated and controlled by S. O. R. S.
DOLPHIN.—Range, 150; system, R. C. of A., 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services 8 c. per word; station operated and controlled by owner of vessel.
EASTERN CLOUD.—Garland S. S. Corp. owner of vessel.
EASTERN IMPORTER.—Range, 200; system, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
EASTERN SEA.—Station operated and controlled by S. O. R. S.
EASTERN STAR.—W. l., 300, 450, 600.
EFFNA.—System, Navy-Kilbourne & Clark, 1000.
EMPIRE STATE.—Name changed to President Wilson.
ESPARTA.—United Fruit S. S. Corp. owner of vessel.
FELTORE.—Range, 300; w. l., 300, 600.
FLORIDIAN.—Station operated and controlled by United American Lines.
FOREST KING.—Rates, North and South American and transoceanic services 8 c. per word; effective August 1, next.
FRED'K LUCKENBACH.—Name changed to Castle Lodge.
GANERI.—Strike out all particulars.
GEORGIAN.—Station operated and controlled by United American Lines.
GLENDARUEL.—Station operated and controlled by I. W. T. Co.
GOLDEN STATE.—Name changed to President Cleveland.
GULFOIL.—W. l., 300, 450, 600.
HALF MOON (KUVX).—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
HAWAIIAN.—Station operated and controlled by United American Lines.
HAWKEYE STATE.—Name changed to President Pierce.
HEFFRON.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
H. F. ALEXANDER.—Range, 200; system, R. C. of A. (v. t. telephone and telegraph, c. w. and i. c. w.); w. l., 300, 550, 600, 1800; rates, North and South American and transoceanic services 8 c. per word; station operated and controlled by R. C. of A.

- H. M. STOREY.**—Standard Oil Co. of Calif. owner of vessel.
H. T. HARPER.—Standard Oil Co. of Calif. owner of vessel.
HUKEY.—Range, 200; system, Navy-Simon, 1000; w. l., 300, 600.
HULVER.—W. l., 300, 450, 600.
IOWAN.—Station operated and controlled by United American Lines.
IPSWICH.—Station operated and controlled by United American Lines.
KERMIT.—Range, 200; w. l., 300, 450, 600; hours, X; station operated and controlled by United American Lines.
KEYSTONE STATE.—Name changed to President McKinley.
LABORER.—Name changed to Wm. G. Howard; Thomas J. Howard owner of vessel.
LAKE ARTHUR.—System; Navy-R. C. of A., 1000.
LAKE WINTHROP.—Station operated and controlled by I. W. T. Co.
LEVIATHAN.—Strike out all particulars.
LEVISA.—United Fruit S. S. Corp. owner of vessel.
LIMON.—United Fruit S. S. Corp. owner of vessel.
MACOMET.—Name changed to Elizabeth; A. H. Bull S. S. Co. owner of vessel.
MADDEQUET.—Name changed to Lillian; A. H. Bull S. S. Co. owner of vessel.
MAJOR WHEELER.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600; hours, X.
MANCHURIA.—W. l., 300, 450, 600; rates, North and South American and transoceanic services 8 c. per word.
MANUKAI.—W. l., 300, 450, 600.
MARORE.—Range, 300; system, R. C. of A., 1000; w. l., 300, 600; rates, North and South American and transoceanic services 8 c. per word; station operated and controlled by R. C. of A.
MARTINIQUE.—Range, 200; system, Navy-I. R. T. Co., 1000; w. l., 300, 450, 600.
MARY.—Bull-Insular S. S. Co. owner of vessel.
MEXICAN.—Station operated and controlled by United American Lines.
MINNESOTAN.—Station operated and controlled by United American Lines.
MONTICELLO.—W. l., 300, 450, 600; hours, X; station operated and controlled by United American Lines.
MONTPELIER.—W. l., 300, 450, 600; hours, X; station operated and controlled by United American Lines.
MOONLITE.—Pacific S. S. Co. owner of vessel.
MOUNT BAKER.—Frank B. Peterson owner of vessel.
MOUNT CARROLL.—Station operated and controlled by United American Lines.
MOUNT CLAY.—Station operated and controlled by United American Lines.
MOUNT CLINTON.—Station operated and controlled by United American Lines.
MYSTIC.—Station operated and controlled by United American Lines.
NACOGDOCHES.—Strike out all particulars.
NEBRASKAN.—Station operated and controlled by United American Lines.
NEVADAN (WFF).—Station operated and controlled by United American Lines.
NEW JERSEY.—Range, 200; system, I. W. T. Co., 1000; w. l., 300, 600; rates, North and South American and transoceanic services 8 c. per word.
NIKA.—W. l., 300, 450, 600; H. K. Goodwin owner of vessel.
NORTHERN STAR.—Range, 300; system, Navy-Wireless Improvement Co., 1000; w. l., 300, 450, 600.
NORTH WIND.—A. C. Burton owner of vessel.
NORWOOD.—Rates, North and South American and transoceanic services 8 c. per word, effective August 1 next.
OHIOAN.—Station operated and controlled by United American Lines.
OREGONIAN.—Station operated and controlled by United American Lines.
ORIENTAL.—Range, 300; system, R. C. of A., 1000; w. l., 300, 600.
ORMIDALE.—Station operated and controlled by I. W. T. Co.

- OZMO.**—Strike out all particulars.
- PANAMAN.**—Station operated and controlled by United American Lines.
- PAN-AMERICA.**—Range, 300; system, Federal arc; w. l., 300, 600, 1300; hours, N.
- PARISMINA.**—United Fruit S. S. Corp. owner of vessel.
- PASTORES.**—United Fruit S. S. Corp. owner of vessel.
- PENINSULA STATE.**—Name changed to President Roosevelt.
- PENNSYLVANIAN.**—Station operated and controlled by United American Lines.
- PENOBSCOT.**—System, Navy-Marconi, 1000.
- PETOSKEY.**—Range, 150; system, R. C. of A., 1000.
- P. J. REILLY.**—Station operated and controlled by I. W. T. Co.
- POZNAM.**—Luckenbach S. S. Co. owner of vessel.
- PRESIDENT GARFIELD.**—System, Navy-Marconi, 1000.
- PRESIDENT ROOSEVELT (KDRW).**—Name changed to Buckeye State.
- PRISCILLA.**—Range, 150; system, Cutting & Washington, 1000; w. l., 300, 450, 550, 600; rates, North and South American and transoceanic services 8 c. per word; station operated and controlled by I. W. T. Co.
- REDWOOD.**—Rates, North and South American and transoceanic services 8 c. per word, effective August 1 next.
- RESCUE.**—Strike out all particulars.
- RESOLUTE (KDYA).**—Station operated and controlled by United American Lines.
- ROCKAWAY PARK.**—System, Navy-Wireless Improvement Co., 1000; w. l., 300, 450, 600.
- SAHALE.**—W. l., 300, 450, 600.
- SAN JOSE.**—United Fruit S. S. Corp. owner of vessel.
- SARAMACA.**—United Fruit S. S. Corp. owner of vessel.
- SEEANDBEE.**—Range, 100; system, R. C. of A. v. t., telephone, and R. C. of A. spark, 1000; w. l., 300, 450, 475, 600.
- SILVER STATE.**—Name changed to President Jackson.
- SIXAOLA.**—United Fruit S. S. Corp. owner of vessel.
- STANLEY.**—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
- STELLARIS.**—W. l., 300, 450, 600.
- SUDBURY.**—Station operated and controlled by United American Lines.
- SURICHCO.**—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.
- SURICO.**—Range, 300; system, Navy, 1000; w. l., 300, 450, 600; rates, North and South American and transoceanic services 8 c. per word.
- TEXAN.**—Station operated and controlled by United American Lines.
- THE LAMBS.**—Range, 300; system, Navy, 1000; w. l., 300, 450, 600; hours, X.
- TIVIVES.**—United Fruit S. S. Corp. owner of vessel.
- TURRIALBA.**—United Fruit S. S. Corp. owner of vessel.
- VALLONIA.**—Strike out all particulars.
- VICTORIOUS.**—System, Navy-Wireless Specialty Apparatus Co., 1000.
- VINCENT.**—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600; hours, X; station operated and controlled by S. O. R. S.
- VIRGINIAN.**—Station operated and controlled by United American Lines.
- WEST IMBODEN.**—Range, 200; w. l., 300, 450, 600.
- WEST ISLETA.**—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
- WILLIAM B. LIVINGSTONE.**—Strike out all particulars.
- WILLIAM M. MILLS.**—Name changed to D. F. McAllister; Daniel F. McAllister owner of vessel.
- W. J. CROSBY.**—North Shore Transit Co., owner of vessel.
- YANKTON.**—Strike out all particulars.
- YOSEMITE (KDWE).**—Rates, North and South American and transoceanic services 8 c. per word, effective August 1 next; station operated and controlled by S. O. R. S.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDCM, *read* President Cleveland; **KDNV**, *read* President Pierce; **KDPA**, *read* President Jackson; **KDRW**, *read* Buckeye State; **KDSL**, *read* President McKinley; **KDSV**, *read* President Wilson; **KDVR**, *read* President Madison; **KDWS**, *read* President Roosevelt; **KEJT**, *read* D. F. McAllister; **KGv**, *read* Castle Lodge; **KIFL**, *read* Stellaris; **KIST**, *read* Wm. G. Howard; **KOKT**, *read* Irene; **KORC**, *read* Elizabeth; **KOZC**, *read* City of Los Angeles; **KUGZ**, *read* Lillian; **WBC**, *read* New York, N. Y.; **WDF**, *read* Glendaruel; **WGB**, *read* Ormidale; **WSE**, *read* East Moriches, N. Y.; **strike out** all particulars following the call signals, **KDAQ**, **KDDW**, **KDWT**, **KDXH**, **KELR**, **KEQG**, **KERL**, **KESL**, **KFT**, **KGc**, **KIBZ**, **KKIU**, **KOBS**, **KRP**, **KUJL**, **KULR**, **WAX**, **WDJ**, **WDK**, **WKOU**, and **WQB**.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921.]

AKUTAN, ALASKA.—Service, O; hours, X.
BOSTON, MASS. (WVO).—Service, O; hours, X.
BURWOOD, LA.—Strike out all particulars.
JUPITER, FLA. (radio compass station).—Strike out all particulars.
PUGET SOUND, WASH. (NPZ).—Call changed to NPC.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1921.]

AUK.—Strike out all particulars.
BROOKLYN.—Strike out all particulars.
DIX.—Strike out all particulars.
EDER (KOKJ).—Call signal changed to NURK.
LEBANON.—Strike out all particulars.
NORTH PACIFIC.—Strike out all particulars.
OSPREY.—Strike out all particulars.
SCHENCK.—Correct orthography Schenck.
S. C. 426.—Strike out all particulars.
TATTNAL.—Correct orthography Tattnall.
TRACEY.—Correct orthography Tracy.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KOKJ *read* NURK; **NEMG**, *read* Schenck; **NEPS**, *read* Tattnall; **NPZ**, *read* NPC; **NUJL**, *read* Tracy; **strike out** all particulars following the call signals, **NAQ**, **NBX**, **NFA**, **NIJL**, **NIJT**, **NIQC**, **NIZ**, **WIM**, and **WXC**.

BROADCASTING STATIONS, BY CALL SIGNALS.

KHJ (Los Angeles, Calif.).—W. 1., 360, 485.
KJR (Seattle, Wash.).—W. 1., 360 only.
KMJ (Fresno, Calif.).—W. 1., 360, 485.
KOJ (Reno, Nev.).—Strike out all particulars.
KQL (Los Angeles, Calif.).—Strike out all particulars.
KWH (Los Angeles, Calif.).—W. 1., 360, 485.
KZY (Oakland, Calif.).—*Read* San Francisco, Calif., 646 Mission Street.
WAAB (New Orleans, La.).—Station operated and controlled by Valdemar Jensen, 137 South St. Patrick Street.
WAAF (Chicago, Ill.).—Station operated and controlled by Chicago Daily Drovers Journal.
WAAG (Shreveport, La.).—Address 341 Liatre Street.

WAAK (Milwaukee, Wis.).—W. 1., 360, 485.
 WCK (St. Louis, Mo.).—W. 1., 360, 485.
 WGH (Montgomery, Ala.).—Strike out all particulars.
 WGI (Medford Hillside, Mass.).—W. 1., 360, 485.
 WGY (Schenectady, N. Y.).—W. 1., 360, 485.
 WLK (Indianapolis, Ind.).—Address 75 North New Jersey Street.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

ATLANTA, GA. (4XA).—W. 1., 200, 275, 375.
 BANOR, ME. (1XG).—W. 1., 275, 375.
 BERKELEY, CALIF. (6ZAF).—Address 65 Market Street.
 BLACKWELL, OKLA. (5ZZ).—Address 304 West College Street.
 BUFFALO, N. Y. (8XAD).—W. 1., 200, 250, 375.
 BUFFALO, N. Y. (8YQ).—Strike out all particulars.
 CAMDEN, N. J. (3YQ).—Address 201 Federal Street.
 CAMP DIX, N. J. (2YA).—Strike out all particulars.
 CLEVELAND, OHIO (8ZP).—5415 Herman Avenue.
 DALLAS, TEX. (5XG).—Strike out all particulars.
 DEARBORN, MICH. (8XD).—W. 1., 460, 480, 500, 520.
 ELLSWORTH, ME. (1XC).—W. 1., 275, 375.
 FORT PIERCE, FLA. (4ZN).—Strike out all particulars.
 GAINESVILLE, FLA. (4ZC).—Strike out all particulars.
 GREENSBORO, N. C. (4ZA).—Strike out all particulars.
 HIGHLAND PARK, MICH. (8XAF).—W. 1., variable 200 to 530.
 HOBOKEN, N. J. (2XD).—Address 160 Duane Street, New York, N. Y.
 HOUSTON, TEX. (5ZE).—Address Brookline Avenue.
 JACKSON, TENN. (5YB).—Strike out all particulars.
 LANSING, MICH. (8XM).—Strike out all particulars.
 LEXINGTON, VA. (3ZX).—Address 23 Edmundson Avenue.
 LITTLE ROCK, ARK. (5YH).—Strike out all particulars.
 LOS ANGELES, CALIF. (6XN).—Strike out all particulars.
 MOUNT CARROLL, ILL. (9ZG).—Read Byron, Ill.
 MOUNT CLEMENS, MICH. (8XAE).—Address Penobscot Building, Detroit, Mich.
 NEW YORK, N. Y. (2XK).—Address 10 West Belmont Street.
 NORTHVILLE, MICH. (8XL).—W. 1., 425, 500.
 OAKLAND, CALIF. (6XC).—Read San Francisco, Calif., 646 Mission Street.
 OAKLAND, CALIF. (6ZAE).—Address 1045 Eighty-third Avenue.
 PAWTUCKET, R. I. (1XAD).—Address 90 Bayley Street.
 PHILADELPHIA, PA. (3XI).—Strike out all particulars.
 PHILADELPHIA, PA. (3YI).—Strike out all particulars.
 PITTSBURGH, PA. (8XV).—Montier Street, Wilkinsburg, Pa.
 RICHMOND, VA. (3ZL).—Strike out all particulars.
 ROCK ISLAND, ILL. (9XAC).—Read Davenport, Iowa; w. 1., variable; address 313 East Twenty-ninth Street.
 SAVANNAH, GA. (4XB).—W. 1., 280, 375.
 SCHENECTADY, N. Y. (2XQ).—W. 1., 250, 1500.
 SEATTLE, WASH. (7XE).—Address 233 Broadway, New York, N. Y.
 SUNNYVALE, CALIF. (6XAG).—Address 121 East San Fernando Street.
 URBANA, ILL. (9XZ).—Address 715 Michigan Avenue.
 WACO, TEX. (5ZF).—Address Box 427.
 WASHINGTON, D. C. (3YA).—Address 401 Ninth Street NW.
 WASHINGTON, D. C. (3ZF).—1656 Newton Street NW.
 WHEELING, W. VA. (8ZW).—Station operated and controlled by John O. Stroebe, jr., and Earl W. Weimer; address 42 Poplar Avenue.
 WHITFORD, PA. (3ZT).—Address "South Hill."

MISCELLANEOUS.

COMMUNICATIONS FOR BLACK SEA PORTS.

The United States Navy Department has assigned call letters NTTX as a general call for any naval vessel stationed at Constantinople. A station ship is maintained there at all times with continuous radio watch. Any United States Shipping Board vessel having communications for Black Sea ports can clear same through this station on 600 meters without charge. The vessel also collects communications from vessels in the Black Sea intended for Shipping Board representatives at Constantinople and London or other Shipping Board vessels in that vicinity.

ADMIRALTY NOTICE TO MARINERS.

St. John's W/T station (BZM) will close down about the end of May, 1922.

The broadcasting of synoptic weather reports by Aberdeen W/T station (call signal BYD) has ceased.

Carnore W/T D. F. station has ceased to operate.

Particulars regarding the Kidbrooke W/T station: Position, lat. $51^{\circ} 28' N.$, long. $0^{\circ} 02' E.$ (approximately); call signal, GFA; wave length, 4,100 meters c. w.; details, weather bulletins are broadcasted daily by this station at 0830 G. M. T. (civil). The bulletin consists of a synoptic data message and contains the same details formerly transmitted by Aberdeen W/T station.

—From Admiralty Notice to Mariners, No. 755, of the year 1922.

ALASKAN STATIONS REOPENED.

The stations named below opened for the season as follows: Becherof (KUDV), June 5; Metha Nelson (KMP), June 12; Daly (KDJT), June 13; Hawk Inlet (KKAI), June 23.

KILLED WHILE ERECTING AERIAL.

Recently in Cleveland, Ohio, a father, 48 years of age, and his son, 15 years of age, were killed in a tragedy brought on when an aerial touched a 2,200-volt wire. In a hurry to set up a receiving set to hear a concert the young son, with the aid of another boy, who was seriously burned, had attached the aerial to the chimney of his house, and in doing so threw it over a high-tension wire. Not heeding the caution of other persons to tie a rope to the aerial, the young men clutched it. In the meantime friction of the aerial had rubbed off the insulation of the electric wire, a flash, the youth was killed instantly, and his father, who rushed to save him, died within a few minutes. This fatality should serve as a warning to others to be extremely careful in avoiding high-tension wires, and for that purpose this narrative is published.

OPERATORS' LICENSES SUSPENDED.

First-class, second-grade license No. 1359, issued at Baltimore, Md., August 29, 1921, has been suspended for a period of three months for violation of section 5, act of August 13, 1912, in that he willfully interfered with the transmission of another station.

First-class, second-grade license No. 3895, issued at New York, N. Y., June 27, 1922, has been suspended for a period of three months for violation of article 6 of the International Convention service regulations, in that he carried on an unofficial conversation with the operator of another vessel.

INFORMATION FROM THE BERNE INTERNATIONAL BUREAU.

Great Britain.—The coast station Grimsby radio is now open, call signal GKZ. Beginning January 1, 1922, ships at sea will be able to obtain the following information by sending to one of the coast stations Cullercoats radio, Devized radio, Fishguard radio, Grimsby radio, Land's End radio, Malin Head radio, Niton radio, North Fore-

land radio, Port Patrick radio, Seaforth radio, Valentia radio, and Wick radio a radio-telegram drawn up in the form indicated below:

Information requested.

1. A report of the local weather conditions predominating at a coast station of any post office or at a signal station of Lloyd's in the United Kingdom.
2. Information on the weather in different regions of the United Kingdom or of the continent.
3. Previsions of the weather of the Meteorological Office.

Form of radiogram to use.

1. Indicate weather at ——— 1. (1, write name of the station with the subject on which one desires information and the name of the ship.)
2. Indicate weather at ——— meteorological ——— 2. (2, write name of ship.)
3. Indicate forecast for next ——— 3; ——— 4; meteorological ——— 5. Indicate previsions for the ——— 3 next hours ——— 4; meteorological ——— 5. (3, period ought to be indicated in hours and not to exceed 48 hours; 4, region or route desired; 5, name of ship.)

The tax due to the coast station for the request and the reply is 6 francs 25 centimes in case where the reply can be given from the information already in possession of the coast station with which the ship is in communication. Where the coast station has to obtain the information, the tax is 9 francs and 37½ centimes, which includes the charges for an interior telegram anywhere which may be necessary.

British West Indies.—The coast rate of the Kingston (Jamaica) station is 60 centimes per word; no minimum.

Mesopotamia.—The station Basra radio is now open to service with ships. The rate is 80 centimes per word.

Dutch Indies.—Beginning April 1 last the coast charge for all stations of the Dutch Indies open to general public correspondence is 60 centimes per word; no minimum.

Russia.—The coast charge of Russian stations open to general public service is 60 centimes per word; no minimum. The interior rate of Russia, applicable on ordinary radiograms originating in or addressed to this country and exchanged directly with coast stations of this same country, is 13 centimes per word; no minimum.

New Ireland.—The coast charge for the station Kaeweing radio is 30 centimes per word, no minimum, for radiograms exchanged with ships of Australia and New Zealand and 60 centimes per word for vessels other than those of Australia and New Zealand.

Solomon Islands.—The coast charge of the station Kieta radio is 30 centimes per word, no minimum, for radiograms from vessels of Australia and New Zealand and 60 centimes per word, no minimum, for vessels other than those of Australia and New Zealand.

INTERFERENCE WITH ICE REPORTS.

During the broadcasting of ice reports by the North Atlantic ice patrol vessels the radio stations of ships while in the vicinity of the patrol vessels are required by Article XLV, paragraph 3, International Convention service regulations, to cease all transmitting except distress signals. A number of complaints of violation of this regulation have been recently received by this office, and in order to eliminate this interference the department may suspend the license of any operator who maliciously interferes with the transmission of such reports.

The following is from the Hydrographic Bulletin, June 28 last: "The ice patrol vessels send out information daily relative to the ice conditions, namely, 6 p. m. and 4 a. m. (seventy-fifth meridian), but owing to the use of radio by vessels * * * the interference is so great that the purpose of the patrol is not accomplished, as it is often impossible, especially at 4 a. m., for the receiving stations to secure the information desired in time to be of the fullest benefit to shipping."

ERROR IN MAY BULLETIN REGARDING CALL SIGNALS OF NAVAL STATIONS.

On page 17 of the Bulletin for last month the following corrections should be made in the list of stations given at the bottom of the page: St. Thomas, Virgin Islands, call signal NBB; San Juan, call signal NAU; Navassa Island, call signal NKC; Guantanamo, Cuba, call signal NAW.

EIFFEL TOWER TIME SIGNALS.

Time signals are now transmitted from Eiffel Tower at 9.25 a. m. and 10.45 p. m., instead of 10 a. m. and 11.45 p. m.

RATES FOR CANADIAN STATIONS ON PACIFIC COAST.

Effective the first of this month, the coast station rate of the Canadian government stations on the Pacific coast will be reduced from 12 to 10 cents per word.

LOUISBURG (CAPE BRETON) STATION.

The Marconi Wireless Telegraph Co. of Canada has opened a continuous wave coast station at Louisburg, call signal VAS, normal transmitting wave, 2200. Coast rate 10 cents per word.

SCHEDULE OF LEAFIELD AND CLIFDEN STATIONS.

This office has been advised that on and from June 5 to 6, the period during which the high power continuous wave station Oxford-Radio (Leaffield) will transmit radiograms to ships, will be 0100-0150 G. M. T. daily instead of 2300-2400 G. M. T., as heretofore. In consequence of the above it has been necessary for us to change the times of transmission of private messages and press from the Clifden station. Therefore, on and from the morning of June 6, Clifden will commence the program to ships at 0200 G. M. T. instead of 0100 G. M. T. Arrangements have been made for the notification of the alteration to be broadcasted from both Leaffield and Clifden and instructions have been also given to telegraphists on outward-bound ships to advise homeward-bound ships of the alteration in the times of transmission by the respective stations.

BROADCASTING SCHEDULE OF MARKET REPORTS.

The following is a broadcasting schedule of market reports by radio. These reports are sent as press items, except where it is indicated that they are sent in code form. Forms are necessary for copying the reports sent by code, sample copies of which may be obtained from this bureau for Federal and air mail stations and for all others by writing to the broadcasting station direct. While this schedule is not complete, it is the most accurate that can be prepared from the information available and will be revised as rapidly as data are received. With the exception of Federal stations, practically all market, crop, and weather reports are sent out on 485 meters, while entertainment, news, etc., are broadcasted on 360 meters.

Federal, State, and private broadcasting stations.

[Submitted by Bureau of Agricultural Economics.]

Name and call letters of station.	Nature of reports.	Source.	Time of transmission.	Type of transmission.
Arlington, Va. (Washington, D. C.), Navy Radio Station, NAA.	Live stock receipts five or more principal markets (code).	Federal.....	<i>Eastern standard time.</i> 8.45 a. m.....	Telegraph, 5950 meters continuous wave transmission.
	Weather forecast.....	do.....	10.00 a. m.....	Do.
	Hog market flash, Chicago and St. Louis.	do.....	11.15 a. m.....	Do.
	Fruit and vegetable shipments and shipping point information.	do.....	11.20 a. m.....	Do.
	Fruit and vegetable markets.....	do.....	1.40 p. m.....	Do.
	Crop reports and special market news.....	do.....	2.25 p. m.....	Do.
	Closing live stock markets.....	do.....	3.45 p. m.....	Do.
	Hay and feed markets, Monday, Wednesday, and Friday.	do.....	4.00 p. m.....	Do.
	Weather forecast.....	do.....	5.00 p. m.....	Do.
	Daily marketgram.....	do.....	5.30 p. m.....	Do.
	Weather forecast.....	do.....	9.45 p. m.....	Do.
Ames, Iowa: Iowa State College, WOI.	Information not available.....	do.....	Central time.	Phone.
Atlanta, Ga.: Atlanta Constitution, WGM.	Information not available.....	do.....	do.....	Do.
Atlanta, Ga.: Atlanta Journal, WSB.	Weather reports.....	Federal.....	<i>Central time.</i> 12.00 noon.....	Phone.
	Market report, close on cotton, grain, and spot quotations.	do.....	2.30 p. m.....	Do.
	Entertainment.....	Local.....	4.00 p. m.....	Do.
	Ball score, news, etc.....	do.....	5.00 p. m.....	Do.
Austin, Tex.: University of Texas, WCM.	Entertainment.....	do.....	7.00 p. m.....	Do.
	Opening cotton and grain markets.	do.....	9.30 a. m.....	Phone.
	Noon call on cotton.....	Local.....	12.30 p. m.....	Do.
	Live stock report.....	do.....	2.45 p. m.....	Do.
	Close on cotton and grain.....	do.....	3.15 p. m.....	Do.
	Laredo onion report and general shipping point news.	do.....	4.00 p. m.....	Do.
	Report on markets of Dallas, Fort Worth, Houston, and San Antonio, and general crop information.	do.....	8.00 p. m.....	Do.
Boston, Mass. (Worcester): Clark University, WCN.	Weather reports.....	Federal.....	<i>Eastern time.</i> 11.15 a. m.....	Do.
	Massachusetts State market reports.	State.....	do.....	Do.
	Weather reports.....	Federal.....	5.15 p. m.....	Do.
Bridgeport, Pa.: Diamond State Fiber Co., WBAG.	Market and crop reports.....	do.....	11.45 a. m.....	Do.
Buffalo, N. Y.: Federal Telegraph & Telephone Co., WGR.	Music (Thursday).....	Local.....	7.30 p. m.....	Do.
Charlotte, N. C.: Southern Radio Corporation, WBT.	New York State market reports.....	State.....	12.00 noon.....	Do.
	Weather reports.....	Federal.....	5.30 p. m.....	Do.
	New York State market reports.....	State.....	5.30 p. m.....	Do.
	Education talks and entertainment.	Local.....	7.30 p. m.....	Do.
	Weather reports.....	Federal.....	11.00 a. m.....	Do.
	Ball scores, etc.....	Local.....	6.00 p. m.....	Do.
	Market reports.....	Federal.....	8.00 p. m.....	Do.
Chicago, Ill.: Westinghouse Electric & Manufacturing Co., KYW.	Entertainment.....	Local.....	8.30 p. m.....	Do.
	Fruit, vegetable, live stock, and grain (code).	Federal.....	<i>Central time.</i> 2.15 p. m.....	Do.
	Fruit, vegetable, live stock, grain and dairy products (code).	do.....	4.15 p. m.....	Do.
	Fruit, vegetable, live stock, and feeds.	do.....	6.00 p. m.....	Do.
Cincinnati, Ohio: Cino Radio Manufacturing Co., WIZ. Crosley Manufacturing Co., WLW.	Fruit, vegetable, live stock, grain, and dairy products (code).	do.....	7.30 p. m.....	Do.
	Wholesale fruit and vegetable report.	do.....	12.00 noon.....	Do.
	Live stock report, Chicago and St. Louis.	do.....	3.00 p. m.....	Do.
	Financial and market report.....	do.....	<i>Eastern time.</i> 1.00 p. m.....	Do.
	Entertainment, etc.....	Local.....	3.00 p. m.....	Do.
	Talks, news items, music.....	do.....	3.00 p. m.....	Do.
	Wholesale fruit and vegetable report.	Federal.....	<i>Central time.</i> 11.00 a. m.....	Do.
	Live stock report, Chicago and St. Louis.	do.....	4.00 p. m.....	Do.
Precision Equipment, WMH.				

1 Not broadcasted on Saturdays from June 15 to Sept. 15.

Federal, State, and private broadcasting stations—Continued.

Name and call letters of station.	Nature of reports.	Source.	Time of transmission.	Type of transmission.
Dayton, Ohio: Rike-Kumler Co., WFO.	Weather report.....	Federal.....	<i>Central time.</i> 11.30 a. m.....	Phone.
	Entertainment and news.....	Local.....	9.00 a. m.....	Do.
	do.....	do.....	11.00 a. m.....	Do.
	Market report and weather.....	Federal.....		Do.
	News and entertainment, Monday, Wednesday, Thursday.....	Local.....	4.00 p. m.....	Do.
	do.....	do.....	7.00 p. m.....	Do.
	do.....	do.....	9.30 a. m.....	Do.
Detroit, Mich.: The Detroit News, WWJ.	Weather report.....	Federal.....	10.15 a. m.....	Do.
	United States time signals.....	do.....	11.55 a. m.....	Do.
	Entertainment.....	Local.....	12.05 p. m.....	Do.
	Market quotations.....	do.....	3.30 p. m.....	Do.
	Weather report.....	Federal.....	4.05 p. m.....	Do.
	Sport and world news.....	Local.....	5.00 p. m.....	Do.
	Entertainment.....	do.....	7.00 p. m.....	Do.
Eldorado, Kans.: Midland Refining Co., WAH.	Weather and market report.....	Federal.....	10.30 a. m.....	Do.
	Market report.....	do.....	1.30 p. m.....	Do.
	Weather report.....	do.....	3.30 p. m.....	Do.
	Entertainment.....	Local.....		Do.
	Market report (Saturday).....	Federal.....	1.00 p. m.....	Do.
Elko, Nev.: Air mail radio station, KDEJ.	Live-stock receipts (code).....	do.....	<i>Pacific time.</i> 8.30 a. m.....	3000 arc undamped.
	Live stock Chicago (code).....	do.....	12.00 noon.....	Do.
	do.....	do.....	4.00 p. m.....	Do.
Fort Worth, Tex.: Fort Worth Record, WPA.	Weather report.....	do.....	<i>Central time.</i> 11.30 a. m.....	Phone.
	do.....	do.....	2.30 p. m.....	Do.
	Market report.....	do.....	4.00 p. m.....	Do.
	Ball scores and news.....	Local.....	6.00 p. m.....	Do.
	Entertainment.....	do.....	7.30 p. m.....	Do.
	News and weather reports.....	do.....	10.00 p. m.....	Do.
The Star-Telegram, WBAP.	Produce, grain, and cotton opening.....	Federal.....	8.45 a. m.....	Do.
	Weather report (code).....	do.....	11.00 a. m.....	Do.
	Cotton, grain, sugar, and cattle report (code).....	Local.....	2.00 p. m.....	Do.
	Fort Worth cash grain.....	do.....	3.30 p. m.....	Do.
Great Lakes, Ill. (Chicago, Ill.): Navy radio station, NAJ.	Live-stock receipts (code).....	Federal.....	8.00 a. m.....	Telegraph, 4900 meters continuous-wave transmission.
	Hog market flash, Chicago.....	do.....	8.50 a. m.....	Do.
	Weather forecast.....	do.....	9.00 a. m.....	Do.
	Hog flash five or more markets.....	do.....	10.00 a. m.....	Do.
	Fruit and vegetable shipments, and shipping point information.....	do.....	10.10 a. m.....	Do.
	Dairy products market report, New York and Chicago.....	do.....	10.40 a. m.....	Do.
	Live-stock market:			
	Chicago.....	do.....	11.15 a. m.....	Do.
	Kansas City.....	do.....	11.25 a. m.....	Do.
	St. Louis.....	do.....	11.40 a. m.....	Do.
	St. Paul.....	do.....	12.00 noon ¹	Do.
	Omaha.....	do.....	12.20 p. m. ¹	Do.
	Chicago close code, advance estimated.....	do.....	12.40 p. m. ¹	Do.
	Reports:			
	Grain report (code).....	do.....	1.45 p. m. ¹	Do.
	Fruit and vegetable market report.....	do.....	2.30 p. m. ¹	Do.
	Hay and feed market report.....	do.....	3.45 p. m. ¹	Do.
	Dairy and poultry market report.....	do.....	5.00 p. m. ¹	Do.
	Daily marketgram.....	do.....	6.00 p. m. ¹	Do.
	Weather forecast.....	do.....	9.30 p. m.....	Do.
Hutchinson, Minn.: Hutchinson Electric Service Co., WFAN.	Weather and market reports as transmitted by University of Minnesota.....	State.....	1.00 p. m.....	Phone.
Jefferson City, Mo., Missouri State marketing bureau, WOS.	Market reports, estimated receipts Kansas City, St. Louis, and Chicago hog opening, and Kansas City grain (code).....	Federal and State.....	9.30 a. m.....	Do.
	Kansas City and St. Louis live stock and Kansas City grain.....	do.....	11.30 a. m.....	Do.
	Chicago butter and eggs, St. Louis potatoes, and Kansas City grain (code).....	do.....	2.00 p. m.....	Do.
	Marketgram, general market information (daily except Tuesdays and holidays).....	do.....	5.00 p. m. ¹	Do.

¹ Not broadcasted on Saturdays from June 15 to Sept. 15.

Federal, State, and private broadcasting stations—Continued.

Name and call letters of station.	Nature of reports.	Source.	Time of transmission.	Type of transmission.
Kansas City, Mo.: Sweeney Radio Electric Co., WHB. Western Radio Co., WOQ.	Grain market reports for the Kansas City Board of Trade (half-hour schedule).....	Local.....	<i>Central time.</i> 9.30 a. m. to 12.30 p. m.....	Phone.
	Hog report.....	Federal.....	9.45 a. m.....	
	Live stock Kansas City (code).....	do.....	11.30 a. m.....	
	Fruit and vegetable.....	do.....	11.40 a. m.....	
	Grain report (code).....	do.....	2.00 p. m.....	
	Live stock Kansas City (code).....	do.....	2.10 p. m.....	
	Live stock Chicago (code).....	do.....	2.20 p. m.....	
	Fruit and vegetable, Kansas City, Chicago, and St. Louis.....	do.....	2.30 p. m.....	
	Repeat the 2 and 2.30 p. m. reports	Federal.....	7.30 p. m.....	
	Omaha hogs and sheep, and grain report for Chicago, Omaha, and Kansas City.....	do.....	10.10 a. m.....	
Lincoln, Nebr.: University of Nebraska, WFAV.	Weather forecast, Nebraska.....	do.....		Do.
				Do.
				Do.
				Do.
Los Angeles, Calif.: Leo J. Meyberg Co., KYJ.	Weather forecast.....	do.....	<i>Pacific time.</i> 9.00 a. m.....	Do.
	Lectures University of Southern California.....	Local.....	2.30 p. m.....	Do.
	Stock exchange report.....	do.....	4.00 p. m.....	Do.
	Music and entertainment.....	do.....	4.00 p. m.....	Do.
Madison, Wis.: University of Wisconsin, WHA.	Chicago, potatoes, hogs, cattle, sheep, eggs, butter, cheese, poultry, and hay (code).....	Federal.....	<i>Central time.</i> 12.00 noon.....	Telegraph.
	Weather for Wisconsin.....	do.....	12.20 p. m.....	Do.
	Weather same as at 12.20 p. m.....	do.....	12.25 p. m.....	Phone.
	United States time signal.....	do.....	12.59 p. m.....	Do.
Manhattan, Kans.: Kansas State Agricultural College, WTG.	Weather forecast.....	do.....	9.55 a. m.....	Do.
Memphis, Tenn.: Reichman-Crosby Co., WKN.	Weather and opening cotton market	do.....	11.45 a. m.....	Do.
	Close on cotton, live stock, and produce.....	do.....	2.30 p. m.....	Do.
	Baseball news.....	Local.....	6.00 p. m.....	Do.
	Entertainment.....	do.....	8.15 p. m.....	Do.
Milwaukee, Wis.: Gimbel Brothers Department Store, WAAK.	Sermons (Sunday).....	do.....	11.00 a. m.....	Do.
Minneapolis, Minn.: University of Minnesota, WLB.	Market quotations of Milwaukee Chamber of Commerce.....	do.....	<i>Daylight saving, central time.</i> 10.00, 11.00, 12.10 and 1.25.	Do.
	Weather forecast (Wisconsin).....	Federal.....	11.00 a. m.....	Do.
Newark, N. J.: Westinghouse Electric & Manufacturing Co., WJZ.	Weather report, Minnesota, Wisconsin, North Dakota, South Dakota, and Montana.....	Local.....	<i>Central time.</i> 12.00 noon.....	Telegraph and followed by phone.
	St. Paul live stock summary of morning's market.....	State and Federal.....	12.00 noon.....	
	Minneapolis wheat closing cash and futures, Minneapolis and St. Paul potatoes, summary.....	Local and Federal.....	7.30 p. m.....	
North Platte, Nebr.: Air mail radio station, KDHM.	Market reports, New York City wholesale fruit and vegetable.....	State.....	<i>Eastern time.</i> 12.00 noon.....	Do.
	New York City wholesale fruit and vegetables, eggs, hay, butter, etc.....	do.....	6.00 p. m.....	Do.
	Live stock receipts (code).....	Federal.....	<i>Central time.</i> 9.30 a. m.....	Telegraph. 4000 meters, arc undamped.
	Live stock Chicago (code).....	do.....	12.00 noon.....	
Omaha, Nebr.: Air mail radio station, KDEF.	do.....	do.....	5.00 p. m.....	
	Live stock, Kansas City.....	do.....	8.00 p. m.....	
	Live stock, Omaha, Nebr.....	do.....	8.30 p. m.....	Do.
	Live stock receipts (code).....	do.....	9.00 a. m.....	Telegraph. 2500 meters, arc undamped.
	Live stock, Chicago (code).....	do.....	11.00 a. m.....	
	Live stock, Omaha (code).....	do.....	12.00 noon.....	
	Live stock, Kansas City (code).....	do.....	1.00 p. m.....	
	Grain, Omaha (code).....	do.....	2.00 p. m.....	
	Live stock, Chicago.....	do.....	4.30 p. m.....	
	Live stock, Kansas City.....	do.....	7.00 p. m.....	
	Live stock, Omaha.....	do.....	7.30 p. m.....	Do.

Federal, State, and private broadcasting stations—Continued.

Name and call letters of station.	Nature of reports.	Source.	Time of transmission.	Type of transmission.
Pittsburgh, Pa. (East Pittsburgh) Westinghouse Electric Manufacturing Co., KDKA.	Fruit and vegetable (Pittsburgh) live stock (Chicago), grain. Chicago, hay and feed.....	Federal..... Local.....	<i>Eastern time.</i> 7.45 p. m..... 7.45 p. m.....	Phone. Do.
Reno, Nev.: Air mail radio station, KDEK.	Live stock receipts (code)..... Live stock, Chicago (code).....	Federal..... do.....	<i>Pacific time.</i> 9.00 a. m..... 1.00 p. m.....	Telegraph. 3200 meters, arc undamped.
Richmond, Ind.: Palladium Printing Co., WOZ.	Indianapolis markets..... Weather forecast..... Complete market report..... Weather, local news, music.....	Local..... Federal..... Local..... Federal and local.....	<i>Central time.</i> 12.00 noon..... 4.00 p. m..... 4.00 p. m..... 6.30 p. m.....	Phone. Do. Do. Do.
Rochester, N. Y.: Rochester Times Union, WHQ.	New York State market reports.....	State.....	<i>Eastern time.</i> 7.45 p. m.....	Do.
Rock Springs Wyo.: Air mail radio station KDHN.	Live stock receipts (code)..... Live stock, Chicago (code)..... Live stock, Chicago..... Live stock, Kansas City..... Live stock, Omaha.....	Federal..... do..... do..... do..... do.....	<i>Mountain time.</i> 9.00 a. m..... 12.00 noon..... 4.30 p. m..... 8.00 p. m..... 8.30 p. m.....	Telegraph. 3000 meters, arc undamped. Do. Do. Do.
Schenectady, N. Y.: General Electric Co., WGY.	New York City market fruit and vegetables, butter, eggs, poultry, hay, and country dressed meat.	State.....	<i>Eastern time.</i> 7.00 p. m.....	Phone.
St. Louis Mo.: St. Louis University, WEW.	Market report, live stock receipts, St. Louis and Chicago hog opening (code)..... St. Louis and Kansas City opening, trend of market, Liverpool cables. Fruit and vegetable, Chicago potatoes, live stock, St. Louis close, closing grain market. Market reports Saturday.....	Federal..... do..... do..... do.....	<i>Central time.</i> 10.15 a. m..... 10.15 a. m..... 2.15 p. m..... 1.00 p. m.....	Do. Do. Do. Do.
Stix-Baer & Fuller Co., WCK.	Merchants Exchange reports, opening future market. Future market receipts and shipments. Future market..... do..... Closing future market cash grain prices.	Local..... do..... do..... do..... do.....	8.40 a. m..... 9.40 a. m..... 10.40 a. m..... 11.40 a. m..... 12.40 p. m.....	Do. Do. Do. Do. Do.
Springfield, Mass.: Westinghouse Electric & Manufacturing Co., WBZ.	Weather forecast..... Massachusetts State market reports.....	Federal..... State.....	<i>Eastern time.</i>	Do. Do.
State College, N. Mex.: New Mexico College of Agriculture and Mechanical Arts, KOB.	Time signals..... Weather forecast..... Crop reports..... Music and entertainment.....	Federal..... do..... do..... Local.....	<i>Mountain time.</i> 11.55 a. m..... 12.00 noon..... 12.05 p. m..... 8.00 p. m.....	Do. Do. Do. Do.
Tampa, Fla.: Tampa Daily Times, WDAE.	Information not available.....		<i>Eastern time.</i>	Do.
Toledo, Ohio: The William B. Duck Co., WHU.	Grain market (Toledo)..... Live stock and vegetables..... Baseball and news..... Musical entertainment Tuesday and Thursday.....	State..... do..... do..... Local.....	<i>Eastern time.</i> 9.40-12.30 and 1.40. 12.30 p. m..... 5.00 p. m..... 9.00 p. m.....	Do. Do. Do. Do.
Tulsa, Okla.: Midland Refining Co., WAH.	Live stock reports..... Weather forecast..... Concerts (not regular).....	Federal..... do..... Local.....	<i>Central time.</i> 10.30 a. m. and 1.30 p. m. 10.30 a. m. and 3.30 p. m. 7.45 p. m.....	Do. Do. Do.

Federal, State, and private broadcasting stations—Continued.

Name and call letters of station.	Nature of reports.	Source.	Time of transmission.	Type of transmission.
University Place, Nebr.: Nebraska Wesleyan University, WCAJ.	Weather forecast and news.....	Federal and local.	<i>Central time.</i> 8.50 a. m.	Phone.
	Omaha live stock, Chicago grain (code and press).	Federal.....	4.00 p. m. daily 12.15 p. m. Saturday..	Do.
	Concerts, lectures, etc., Tuesday and Thursday.	Local.....	9.30 p. m.	Do.
Washington, D. C.: Post Office Department air mail radio station, WWX.	Fruit and vegetable (Washington, D. C.).	Federal.....	<i>Eastern time.</i> 10.30 a. m.	Phone, 1160 meters.
	Live stock receipts and St. Louis and Chicago hog opening (code).	do.....	12.30 p. m.	Do.
	Live stock, Chicago and St. Louis close (code). ¹	do.....	2.15 p. m.	Do.
	Crop reports and special market news. ¹	do.....	3.00 p. m.	Do.
	General fruits and vegetables. ¹	do.....	3.30 p. m.	Do.
	Dairy products, New York and Chicago (code). ¹	do.....	5.00 p. m.	Do.
	Grain. ¹	do.....	5.30 p. m.	Do.
	Live stock and grain (code). ¹	do.....	7.30 p. m.	Do.
	Fruit and vegetable. ¹	do.....	8.00 p. m.	Do.
Wichita, Kans.: The Cosradio Co., WEY	Board of trade reports; information not available	do.....	do.....	Phone.

¹ Not broadcasted on Saturday from June 15 to Sept. 15.

NOTE.—When no form number is indicated straight copy is used.

INTERDEPARTMENT ADVISORY COMMITTEE ON GOVERNMENTAL RADIO BROADCASTING.

At the request of the Secretary of Commerce each of the 10 Government departments have appointed representatives on an Interdepartment Advisory Committee on Governmental Radio Broadcasting. There are, in addition, representatives of the office of the chief coordinator, Bureau of the Budget, and the United States Shipping Board. The membership of the committee is as follows: Agriculture, W. A. Wheeler, Radio Development Section; Commerce, Dr. S. W. Stratton, director, Bureau of Standards; Interior, O. P. Hood, chief mechanical engineer, Bureau of Mines; Justice, S. Ely, chief clerk; Labor, A. E. Cook, office of the Secretary; Navy, Commander D. C. Bingham, Naval Communication Service; Post Office, J. C. Edgerton, air mail division; State, W. S. Rogers, International Communications Conference; Treasury, L. J. Heath, Public Health Service; War, Maj. Gen. G. O. Squier, chief signal officer; Chief Coordinator, Capt. H. P. Perrill, assistant coordinator, Bureau of the Budget; United States Shipping Board Emergency Fleet Corporation, F. P. Guthrie, head of radio division, operating department.

The chairman of the committee is Dr. S. W. Stratton and the secretary is Dr. J. H. Dellinger, chief of the radio laboratory, Bureau of Standards, Department of Commerce. In accordance with recommendations of the committee an experimental system of Government broadcasting by "primary" broadcast stations has been established, utilizing only previously existing Government stations and equipment. The "primary" stations are stations which broadcast official Government news by continuous wave (code) telegraphy for the purpose of furnishing this information to local broadcast stations for rebroadcasting by radiophone. The eight stations thus far included send out daily bulletins of Government news, mostly agricultural market data. They are: Arlington, Va. (Navy, 5950 meters), Great Lakes, Ill. (Navy, 4900 meters), Washington, D. C. (Post Office, 1980 meters), Omaha, Nebr. (Post Office, 2500 meters), North Platte, Nebr. (Post Office, 4000 meters), Rock Springs, Wyo. (Post Office, 3000 meters), Elko, Nev. (Post Office, 3000 meters), Reno, Nev. (Post Office, 3200 meters).

The committee has made a preliminary classification of the kinds of material which the several departments may have to broadcast by the primary stations, namely, market prices and data, weather and hydrographic news, standard radio signals (such as wave length and time signals), executive announcements, statistics, and educational material. One of the functions of the committee is to advise regarding priority of the types of Government material to be broadcasted and regarding schedules of operation.

The committee has recognized the principle that radio must be used, primarily, for types of service that can not be as satisfactorily given by other means of communication, and that therefore radio broadcasting should not be used in general where wire telegraphy or telephony or printed publication would be as satisfactory. It is possible that the scope of the committee's activities may be extended beyond the subject of broadcasting, and that the committee will act in an advisory capacity to the Secretary of Commerce in matters of Government radio regulation and will consider all radio questions of interdepartmental interest.

—Submitted by Bureau of Standards.

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This edition is the first supplement to the New List of Commercial and Government Radio Stations, edition June 30, 1922.

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, August 1, 1922—No. 64

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name	=Name of station.
Loc.	=Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call	=Call letters assigned.
System	=Radio system used and sparks per second.
Range	=Normal range in nautical miles.
W. l.	=Wave lengths assigned: Normal wave lengths in italics.
Service	=Nature of service maintained:
	PG=General public.
	PR=Limited public.
	RC=Radio compass station.
	P=Private.
	O=Government business exclusively.
Hours	=Hours of operation.
	N=Continuous service.
	X=No regular hours.
	m=a. m. (12 m=midday).
	s=p. m. (12s=midnight).
Rates	=Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co.	=Independent Wireless Telegraph Co.
R. C. A.	=Radio Corporation of America.
S. O. R. S.	=Ship Owners' Radio Service.
C. w.	=Continuous wave.
I. c. w.	=Interrupted continuous wave.
V. t.	=Vacuum tube.
FX.	=Fixed station.

CERTIFICATE: By direction of the Secretary of Commerce this publication is issued as an administrative report and is required for the proper transmission of the public business.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Chicago, Ill. ¹	WQX	140.....	PR (FX)	X	Walter A. Kuehl.
Kanatak, Alaska ²	KGC	300, 525, 600, 1625..	PR (FX)	X	Associated Oil Co.
Pittsburgh, Pa. ³	KQV	200, 425.....	PR (FX)	X	Doubleday-Hill Electric Co.
Port Townsend, Wash. ⁴	KRP	300, 600.....	PG	.....	Port Townsend Radio Co.

¹ Loc. (approximately) 0.87° 37' 00", N. 41° 53' 00"; range, 50; rates, none.

² Loc. (approximately) 0.157° 39' 30", N. 57° 42' 00"; range, 300; system, Kilbourne & Clark, 1000; rates, none.

³ Loc. (approximately) 0.80° 20' 00", N. 40° 20' 00"; range, 200; system, composite, v. t., telephone, and telegraph; rates, none.

⁴ Loc. 0.122° 48' 02", N. 48° 07' 01"; range, 300; system, composite, 250; hours, 12 noon to 11 p. m.: rates, ship service, 6 c. per word.

Commercial land and ship stations, alphabetically by call signals.

[b—ship station; c—land station.]

Call signal.	Name.	Call signal.	Name.
KGC	Kanatak, Alaska.....c	KRP	Port Townsend, Wash.....c
KQV	Pittsburgh, Pa.....c	WQX	Chicago, Ill.....c

Broadcasting stations, alphabetically by names of cities.

[Additions to the List of Radio Stations of the United States, edition June 30, 1922.]

City.	Call signal.	City.	Call signal.
Allentown, Pa.....	WIAN	Neenah, Wis.....	WIAJ
Atlantic City, N. J.....	WHAR	Norfolk, Nebr.....	WJAG
Binghamton, N. Y.....	WIAV	New Orleans, La.....	WIAF
Birmingham, Ala.....	WLAG	Newton, Iowa.....	WIAH
Bluefield, W. Va.....	WHAJ	Norwood, Ohio.....	WIAL
Boise, Idaho.....	KFAU	Ocean City, N. J.....	WIAD
Burlington, Iowa.....	WIAS	Omaha, Nebr.....	WIAK
Butte, Mont.....	KFAP	Paducah, Ky.....	WJAR
Butte, Mont.....	KFBF	Portland, Me.....	WJAL
Cedar Rapids, Iowa.....	WJAM	Reno, Nev.....	KFAS
Cedar Rapids, Iowa.....	WKA	Rockford, Ill.....	WJAB
Cincinnati, Ohio.....	WHAG	Rockford, Ill.....	WJAH
Clarksburg, W. Va.....	WHAK	Rochester, N. Y.....	WHAM
Cleveland, Ohio.....	KDPM	Saginaw, Mich.....	WIAW
Corinth, Miss.....	WHAU	San Antonio, Tex.....	WJAE
Davenport, Iowa.....	WHAJ	San Diego, Calif.....	KFBC
Dayton, Ohio.....	WJAJ	San Jose, Calif.....	KFAQ
Decatur, Ill.....	WHAP	San Luis Obispo, Calif.....	KFBE
Eugene, Oreg.....	KFAT	Santa Ana, Calif.....	KFAW
Galveston, Tex.....	WJAC	Savannah, Ga.....	WHAO
Hanford, Calif.....	KFBD	Seattle, Wash.....	KDZT
Havre, Mont.....	KFBB	Springfield, Mass.....	WJAP
Hollywood, Calif.....	KFAR	Springfield, Mo.....	WJAI
Holyoke, Mass.....	WHAX	Stockdale, Ohio.....	WJAK
Huntington, Ind.....	WHAY	Tacoma, Wash.....	KFBG
Joplin, Mo.....	WHAH	Tampa, Fla.....	WHAW
Joplin, Mo.....	WJAC	Tarkio, Mo.....	WJAT
Lansing, Mich.....	WHAJ	Troy, N. Y.....	WHAZ
Le Mars, Iowa.....	WJAU	Venice, Calif.....	KFAV
Lewiston, Idaho.....	KFBA	Vinton, Iowa.....	WJAE
Lincoln, Nebr.....	WJAX	Waco, Tex.....	WJAD
Lincoln, Nebr.....	WJAB	Washington, D. C.....	WHAQ
Lincoln, Nebr.....	WKAC	Washington, D. C.....	WJAY
Louisville, Ky.....	WHAJ	Waupaca, Wis.....	WJAA
Marion, Ind.....	WJAO	Wichita, Kans.....	WJAN
Milwaukee, Wis.....	WJAO	Wichita Falls, Tex.....	WJAF
Moscow, Idaho.....	KFAN	Wilmington, Del.....	WJAV
Muncie, Ind.....	WJAF	Yale, Okla.....	WJAT

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters), alphabetically by call letters.

[Additions to the List of Radio Stations of the United States, edition June 30, 1922.]

Call signal.	Station operated and controlled by—	Location of station.	Wave lengths.
KDPM	Westinghouse Electric & Mfg. Co.	Cleveland, Ohio.	360
KDZT	Seattle Radio Association.	Seattle, Wash.	360
KFAN	The Electric Shop.	Moscow, Idaho.	360
KFAJ	Standard Publishing Co.	Butte, Mont.	360
KFAQ	City of San Jose.	San Jose, Calif.	360
KFAR	Studio Lighting Service Co. (O. K. Olesen).	Hollywood, Calif., 1645 Hudson Avenue	360
KFAS	Reno Motor Supply Co.	Reno, Nev.	360
KFAT	S. T. Donohue	Eugene, Oreg., 681 Willamette Street.	360
KFAU	Boise High School, independent school district of Boise City.	Boise, Idaho.	360, 485
KFAV	Cooke & Chapman	Venice, Calif.	360
KFAW	The Radio Den.	Santa Ana, Calif.	360
KFBA	Ramey & Bryant Radio Co.	Lewiston, Idaho.	360
KFBB	F. A. Buttrey & Co.	Havre, Mont.	360
KFBC	W. K. Azbill.	San Diego, Calif., 5038 Cliff Place.	360
KFBD	Clarence V. Welch.	Hanford, Calif., 315 North Douty Street	360
KFBE	Reuben H. Horn.	San Luis Obispo, Calif.	360
KFBF	Butte School of Telegraph (F. H. Smith).	Butte, Mont.	360
KFBG	First Presbyterian Church.	Tacoma, Wash.	360
WHAG	University of Cincinnati.	Cincinnati, Ohio.	360
WHAH	John T. Griffin.	Joplin, Mo., 112 West Sixth Street.	360
WHAJ	Radio Equipment & Mfg. Co.	Davenport, Iowa.	360
WHAJ	Bluefield Daily Telegraph and E. K. Kitts.	Bluefield, W. Va.	360
WHAJ	Roberts Hardware Co.	Clarksburg, W. Va.	360
WHAJ	Phillips Jeffery & Derby.	Lansing, Mich.	360
WHAM	University of Rochester.	Rochester, N. Y.	360
WHAN	Southwestern Radio Co.	Wichita, Kans.	360
WHAO	Frederic A. Hill.	Savannah, Ga.	360
WHAP	Dewey L. Otta.	Decatur, Ill., 659 West Eldorado Street.	360
WHAQ	Semmes Motor Co.	Washington, D. C.	360
WHAR	Paramount Radio & Electric Co.	Atlantic City, N. J.	360
WHAS	Courier-Journal and Louisville Times.	Louisville, Ky.	360, 485
WHAT	Yale Democrat-Yale Telephone Co.	Yale, Okla.	360
WHAU	Corinth Radio Supply Co.	Corinth, Miss.	360
WHAU	Wilmington Electrical Specialty Co.	Wilmington, Del.	360
WHAU	Pierce Electrical Co.	Tampa, Fla.	360
WHAX	Holyoke Street Ry. Co.	Holyoke, Mass.	360
WHAY	Huntington Press.	Huntington, Ind.	360, 485
WHAZ	Rensselaer Polytechnic Institute	Troy, N. Y.	360
WIAA	Waupaca Civic and Commerce Association	Waupaca, Wis.	360
WIAB	Joslyn Automobile Co.	Rockford, Ill.	360
WIAC	Galveston Tribune.	Galveston, Tex.	360
WIAD	Ocean City Yacht Club.	Ocean City, N. J.	360
WIAE	Mrs. Robert E. Zimmerman.	Vinton, Iowa.	360
WIAF	Gustav A. De Cortin.	New Orleans, La., 139 North Alexander Street.	360
WIAG	Matthews Electrical Supply Co.	Birmingham, Ala.	360
WIAM	Continental Radio & Mfg. Co.	Newton, Iowa.	360
WIAI	Heer Stores Co.	Springfield, Mo.	360
WIAJ	Fox River Valley Radio Supply Co.	Neenah, Wis.	360
WIAK	Journal-Stockman Co.	Omaha, Nebr.	360, 485
WIAL	Standard Service Co.	Norwood, Ohio.	360
WIAM	Chronicle & News Publishing Co.	Allentown, Pa.	360
WIAO	School of Engineering of Milwaukee and Wisconsin News.	Milwaukee, Wis.	360
WIAP	Radio Development Corp.	Springfield, Mass.	360
WIAQ	Chronicle Publishing Co.	Marion, Ind.	360
WIAR	J. A. Rudy & Sons.	Paducah, Ky.	360
WIAS	Burlington Hawkeye & Home Electric Co.	Burlington, Iowa.	360
WIAT	Leon T. Noel.	Tarkio, Mo.	360
WIAU	American Trust and Savings Bank.	Le Mars, Iowa.	360
WIAV	New York Radio Laboratories.	Binghamton, N. Y.	360
WIAW	Saginaw Radio & Electric Co.	Saginaw, Mich.	360
WIAZ	Capitol Radio Co. (Paul C. Rohwer).	Lincoln, Nebr.	360
WIAZ	Woodward & Lothrop.	Washington, D. C.	360
WIAB	American Radio Co.	Lincoln, Nebr.	360
WIAC	Redell Co.	Joplin, Mo.	360
WIAD	Jackson's Radio Engineering Laboratories.	Waco, Tex.	360
WIAE	Texas Radio Syndicate.	San Antonio, Tex.	360
WIAF	Munsey Press.	Munsey, Ind.	360
WIAJ	Norfolk Daily News (Huse Publishing Co.).	Norfolk, Nebr.	360
WIAH	Central Park Amusement Co.	Rockford, Ill.	360
WIAJ	Y. M. C. A.	Dayton, Ohio.	360
WIAK	White Radio Laboratory.	Stockdale, Ohio.	360
WIAL	Victor Radio Corp.	Portland, Me.	360
WIAM	D. M. Perham.	Cedar Rapids, Iowa.	360
WKAA	Republican Times and H. F. Paar.	do.	360
WKAC	Star Publishing Co.	Lincoln, Nebr.	360
WKAF	W. S. Radio Supply Co.	Wichita Falls, Tex.	360

Government land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Serv-ice.	Hours.	Station controlled by—
Bethel, Alaska.....	WVI				U. S. Army.
Jupiter, Fla. (RC)¹.....	NAQ	800.....	RC	X	U. S. Navy.
Selfridge Field, Mich. (Mount Clemens).	WYAO				U. S. Army.

¹ Loc. 0.80° 04' 57", N. 26° 56' 59"; range, 150; system, U. S. Navy.

Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Grant.....	WXH	U. S. Army.

Government land and ship stations, alphabetically by call signals.

[b—ship station; c—land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NAQ	Jupiter, Fla.....c	WXH	Grant.....b
WVI	Bethel, Alaska.....c	WYAO	Selfridge Field, Mich. (Mount Clemens).c

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922.]

Station.	Call signal.	Wave lengths.	Station controlled by—
Birmingham, Ala.....	5XAG	800, 375.....	Matthews Electrical Supply Co.
Butte, Mont.....	7YP	800, 375.....	Butte College of Telegraphy (F. H. Smith).
Corvallis, Oreg.....	7YJ	800, 375.....	Oregon Agricultural College, department of physics.
Fort Worth, Tex.....	5ZAH	800, 375.....	Fort Worth Record.
Do.....	5ZY	800, 375.....	Fort Worth Star Telegram.
Galesburg, Ill.....	9XW	800, 250, 375.....	Lombard College.
Pittsburgh, Pa.....	8XY	Variable.....	West Penn Power Co.
Portland, Oreg.....	7XL	250-1650.....	Northwestern Electric Co.
Raleigh, N. C.....	4YC	800, 375.....	North Carolina State College (electrical engineering department).
Reading, Pa.....	3XAH	800.....	Donald B. Heilman, 54 South Sixth Street.
Tacoma, Wash.....	7YO	800, 375.....	Tacoma City College.
Troy, N. Y.....	2XAP	Variable.....	Rensselaer Polytechnic Institute.

Special land stations, grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
2XAP	Second district: Troy, N. Y.	7XL	Seventh district:
3XAH	Third district: Reading, Pa.	7YJ	Portland, Oreg.
4YC	Fourth district: Raleigh, N. C.	7YO	Corvallis, Oreg.
5XAG	Fifth district:	7YP	Tacoma, Wash.
5ZAH	Birmingham, Ala.	8XY	Butte, Mont.
5ZY	Fort Worth, Tex.	9XW	Eighth district: Pittsburgh, Pa.
	Do.		Ninth district: Galesburg, Ill.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

- CLEARWATER, CALIF.—Range, 500; system, Federal arc and composite spark, 480; w. l., 300, 600, 1800, 3375, 4200, 5500; service PG and PR; hours, N; rates, ship service 10 c. per word; PR service is with other stations of the F. T. Co.
- DETROIT, MICH. (WQX).—Strike out all particulars.
- EAST MORICHES, N. Y.—Service PG and PR; rates, 10 c. per word; PR service is with St. Martins (PJD), Curacao (PJC), Caracas (AYA), Maracai (AYB), and Puerto Cabello (AYC).
- EVERETT, WASH. (KFT).—Rates, 6 c. per word.
- HOG ISLAND, PA.—Strike out all particulars.
- JOHNSWOOD, MICH.—Range, 200.
- KWIGUK SLOUGH, ALASKA (KOV).—Read Carlisle, Alaska; range, 300; loc. (approximately) 0.156° 48' 00'', N. 59° 02' 00''.
- NEW LONDON, CONN. (WLC).—Hours, N.
- NEW ORLEANS, LA.—Rates, ship service 12 c. per word.
- NEW YORK, N. Y. (WCG).—System, Marconi, 1000; w. l., 300, 500, 600; rates, all services 10 c. per word.
- PIKE, KY.—Read Shock, Ky.
- PORT BEAUCLAIRE, ALASKA.—Range, 300.
- RADIOVILLE, ALASKA.—Range, 200; service PG and PR; PR service is point to point service with other land stations in Alaska.
- SAN FRANCISCO, CALIF. (Beach station, KFS).—Range, 500; system, Federal arc and spark, 1000.
- SAN FRANCISCO, CALIF. (KDRO).—Strike out all particulars.
- TOLEDO, OHIO (WQC).—Strike out all particulars.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

NOTE.—(U. S. L.) after operating company denotes that the change applies to the List of Radio Stations of the United States only; does not apply to the Berne list. Hereafter, where the rate is given without the service specifically stated—that is North and South American and transoceanic services—it should be understood that the rate is for both classes of service. When the rate is for one class of service only, the class of service will be stated.

- ABANGAREZ.—United Fruit S. S. Corp. owner of vessel.
- ALBERTA (KFAK).—Strike out all particulars.
- ARGENTA.—Strike out all particulars.
- ARIZONAN.—Range, 300; w. l., 300, 450, 600; rates, 8 c. per word.
- BAYONNE.—Range, 150; system, RCA, 1000; w. l., 300, 450, 600.
- CALAMARES.—W. l., 300, 450, 600.
- CATHERINE.—Bull-Insular S. S. Co. owner of vessel.
- CITY OF COLUMBUS.—System, RCA, 1000.
- CITY OF FLINT.—System, Wireless Specialty Apparatus Co., 1000.
- CITY OF HONOLULU.—Station operated and controlled by RCA (U. S. L.).
- CITY OF LOS ANGELES.—Station operated and controlled by S. O. R. S. (U. S. L.).
- CITY OF SEATTLE.—Miami S. S. Co. owner of vessel.
- COPPENNAME.—United Fruit S. S. Corp. owner of vessel.
- CORCORAN.—Baltimore & Carolina S. S. Co. owner of vessel.
- COUPABLE.—Name changed to Elecedro; Erle M. Leaf owner of vessel.
- COVENA.—Hammond Lumber Co. owner of vessel.
- COWAN.—Name changed to Elabeto; Erle M. Leaf owner of vessel.
- COWANSHANNOCK.—Bethlehem Shipbuilding Corp. owner of vessel.

- COWBOY.—Fred J. Gauntlett owner of vessel.
- DANVILLE.—Station operated and controlled by RCA (U. S. L.).
- DEERFIELD.—Station operated and controlled by S. O. R. S.
- DELPHINE (KDRR).—Range, 300; system, RCA, 1000; w. l., 300, 450, 600; service PG; hours, N; station operated and controlled by RCA.
- DEVOLENTE.—Station operated and controlled by I. W. T. Co. (U. S. L.).
- DOLLY C.—Range, 150; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600; rates, 4 c. per word.
- DUNSYRE.—Range, 200; system, Gray & Danielson, 240; w. l., 300, 600.
- EDGAR F. LUCKENBACH.—Luckenbach S. S. Co. owner of vessel.
- ELIZABETH.—Station operated and controlled by I. W. T. Co.
- EASTERN CLOUD.—Name changed to James B. Duke; station operated and controlled by RCA.
- EASTERN EXPORTER.—Name changed to William Campion; Garland S. S. Corp. owner of vessel; station operated and controlled by RCA (U. S. L.).
- EASTERN IMPORTER.—Name changed to Albert Jeffress; station operated and controlled by RCA (U. S. L.).
- EASTERN MERCHANT.—W. l., 300, 600; hours, X; Luckenbach S. S. Co. owner of vessel; station operated and controlled by S. O. R. S.
- EASTERN OCEAN.—Name changed to George Allen; Garland S. S. Corp. owner of vessel; station operated and controlled by RCA (U. S. L.).
- ETHAN ALLEN.—Station operated and controlled by S. O. R. S. (U. S. L.).
- FEDERAL (KDWH).—Station operated and controlled by S. O. R. S.
- HAMER.—Station operated and controlled by S. O. R. S. (U. S. L.).
- HAMILTON.—Range, 300; system, RCA, 1000; w. l., 300, 600; rates, 8 c. per word; station operated and controlled by RCA.
- HEREDIA.—United Fruit S. S. Corp. owner of vessel.
- HUMRICK.—Station operated and controlled by RCA (U. S. L.).
- GRIFFCO.—Strike out all particulars.
- IRENE.—W. l., 300, 450, 600; station operated and controlled by I. W. T. Co.
- ITOMPA.—Strike out all particulars.
- LAKE FLOURNOY.—System, Navy-International Radio Telegraph Co., 1000; Lone Star S. S. Co. owner of vessel.
- LAKE GLEBE.—Range, 300; w. l., 300, 600.
- LAKE GUNNL.—Range, 200; system, Navy-Marconi, 1000; w. l., 300, 450, 600; station operated and controlled by RCA (U. S. L.).
- LAKE STIRLING.—Name changed to Virginia Express.
- LENA LUCKENBACH.—Station operated and controlled by S. O. R. S.
- LIBERTY.—Station operated and controlled by S. O. R. S. (U. S. L.).
- MASON CITY.—Name changed to Ellenor; A. H. Bull S. S. Co. owner of vessel.
- MEMNON.—Station operated and controlled by S. O. R. S.
- METAPAN.—United Fruit S. S. Corp. owner of vessel.
- MONTICELLO.—System, Navy, 1000.
- MOUNT HOPE.—Range, 150; system, composite, 400; service, PG.
- ORIENTAL.—Name changed to Melville Dollar; Dollar S. S. Line owner of vessel.
- PANAMA.—Rates, 8 c. per word.
- PHILADELPHIA (KSM).—New York-Naples S. S. Co. owner of vessel.
- PINE TREE STATE.—Name changed to President Grant.
- PORTO RICO.—New York & Porto Rico S. S. Co. owner of vessel.
- POZNAM.—Station operated and controlled by S. O. R. S.
- PRESIDENT.—Name changed to Dorothy Alexander.
- PRESIDENT ARTHUR.—System, Navy-Lowenstein, 1000.
- PRESIDENT POLK.—Station operated and controlled by S. O. R. S.
- PRESIDENT ROOSEVELT.—Name changed to President Taft.
- PRESIDENT TAFT.—Name changed to President Harding.

ROSE MAHONEY.—Strike out all particulars.
 SALAAM.—Range, 300; system, Navy, 1000; w. l., 300, 450, 600.
 SAN JACINTO.—Range 300.
 SAN MATEO.—United Fruit S. S. Corp. owner of vessel.
 S. O. Co. No. 91.—Strike out all particulars.
 STANDTOW No. 2.—Strike out all particulars.
 STEEL VOYAGER.—Station operated and controlled by RCA.
 STONEWALL.—Strike out all particulars.
 SURINAM.—Rates, 8 c. per word.
 SURINAME.—United Fruit S. S. Corp. owner of vessel.
 TAMPICO.—Strike out all particulars.
 THEODORE ROOSEVELT.—Strike out all particulars.
 UNDAUNTED (KDSJ).—Range, 200; system, Gray & Danielson, 240; w. l., 300, 600;
 rates, 8 c. per word; station operated and controlled by owner of vessel.
 WEST JESSUP.—Station operated and controlled by I. W. T. Co.
 WEST ZEDA.—W. l., 300, 450, 600.
 WILLIAM A. MCKENNEY.—Range, 200; system, Wireless Specialty Apparatus Co.,
 1000; w. l., 300, 600; station operated and controlled by owner of vessel.
 YUMA.—Di Giorgio Fruit Corp. owner of vessel.
 ZACAPA.—United Fruit S. S. Corp. owner of vessel.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDAZ, *read* William Campion; KDBY, *read* Albert Jeffress; KDJE, *read* Virginia
 Express; KDUT, *read* President Grant; KDWK, *read* President Harding; KDWS,
read President Taft; KDXI, *read* Melville Dollar; KENN, *read* Elabeto; KOV, *read*
 Carlisle, Alaska; KUGX, *read* Ellenor; KUNF, *read* George Allen; KUSQ, *read*
 James B. Duke; WAAI, *read* Shock, Ky.; WGP, *read* Dorothy Alexander; WVOE,
read Elecedro; strike out all particulars following the call signals, KDAB, KDFN,
 KDOV, KDRO, KENR, KPAK, KIKS, KOXR, KPK, KSAE, WCT, WQC,
 WQX, and WTU.

BROADCASTING STATIONS, BY CALL SIGNALS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of
 June 30, 1922.]

KDN (San Francisco, Calif.).—Address Fairmont Hotel.
 KFU (Gridley, Calif.).—Strike out all particulars.
 KQP (Hood River, Oreg.).—W. l., 360 only.
 KSC (San Jose, Calif.).—Strike out all particulars.
 WAAW (Omaha, Nebr.).—W. l., 360, 485.
 WBAJ (Toledo, Ohio).—W. l., 360, 485.
 WBAV (Columbus, Ohio).—W. l., 360, 485.
 WCAD (Canton, N. Y.).—Erroneously given in June Bulletin as Canton, Ohio.
 WGV (New Orleans, La.).—W. l., 360, 485.
 WSY (Birmingham, Ala.).—Hours, 2.30 p. m. except Sunday and 8 p. m. every day.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June
 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ANNAPOLIS, Md. (Naval Academy, NAK).—Service, O; hours, X; rates, none.
 PARRIS ISLAND, S. C.—Rates, ship service 6 c. per word.]

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June
 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

BUFORD.—Strike out all particulars.
 CROOK.—Strike out all particulars.
 GENERAL A. M. RANDAL.—Correct orthography General A. M. Randall.

LOGAN.—Strike out all particulars.

SHERIDAN.—Strike out all particulars.

SHERMAN.—Strike out all particulars.

WARREN.—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals, WXA, WXB, WXF, WXJ, WXX, and WXN; WYJ, *read* General A. M. Randall.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922.]

ALAMEDA, CALIF. (6XA).—Strike out all particulars.

ASHLAND, OHIO (8ZN).—Address 208 Claremont Avenue.

BILOXI, MISS. (5ZAH).—Strike out all particulars.

BOULDER, COLO. (9XAQ).—Station operated and controlled by University of Colorado (department of electrical engineering).

CAMBRIDGE, MASS. (1XO).—Address 11 Windsor Street.

CHICAGO, ILL. (9XAM).—Strike out all particulars.

CHICAGO, ILL. (9XG).—W. l., 200, 375; address, 4601 North Central Park Avenue.

DENVER, COLO. (9ZAG).—Address 1124 South University Street.

EVANSVILLE, IND. (9XAH).—Strike out all particulars.

HAMILTON, OHIO (8XAG).—W. l., 200, 275, 375; address 325 North B Street.

INDEPENDENCE, MO. (9ZAD).—Strike out all particulars.

KANSAS CITY, MO. (9XAB).—W. l., 200, 500; station operated and controlled by Western Radio Co., 6 West Fourteenth Street.

KANSAS CITY, MO. (9XK).—Address 3525 Walnut Street.

LA CROSSE, WIS. (9ZY).—Address 241 South Seventeenth Street.

LANSING, MICH. (8XM).—Call signal erroneously given as 8ZF in June Bulletin.

LITTLE ROCK, ARK. (5ZL).—Address 1301 Welch Street.

LOS ANGELES, CALIF. (6XAQ).—Address 140 South Oxford Street.

LOS ANGELES, CALIF. (6XB).—Strike out all particulars.

MADISON, WIS. (9XM).—W. l., 375, variable; station operated and controlled by University of Wisconsin (department of physics).

MINNEAPOLIS, MINN. (9XI).—W. l., 200, 375, 1100, 2000.

NAPA, CALIF. (6ZAD).—*Read* Sunnyvale, Calif., P. O. Box 391.

NEW ORLEANS, LA. (5XH).—Address of owner 131 State Street, Boston, Mass.

OAKLAND, CALIF. (6XAJ).—Address Hotel Oakland.

OTTUMWA, IOWA (9XAD).—Strike out all particulars.

PARKESBURG, PA. (3XW).—W. l., 375, 2500, variable.

PHILADELPHIA, PA. (3XC).—W. l., 400, 425; address, 2046 Arch Street.

PHILADELPHIA, PA. (3XV).—W. l., 200, 250, variable; address, 5847 Ellsworth Street.

PORT ARTHUR, TEX. (5XV).—W. l., 200, 225, 250, variable; station operated and controlled by Louis W. Hatry, 2048 Fifth Street.

PORTLAND, OREG. (7ZB).—Address 555 East Forty-fourth Street North.

PORTLAND, OREG. (7ZT).—Address 967 Vernon Avenue.

SAN FRANCISCO, CALIF. (6XJ).—Strike out all particulars.

SAN FRANCISCO, CALIF. (6XX).—Address 433 California Street.

SOUTH PASADENA, CALIF. (6XAS).—W. l., 200, 260, variable.

SPRINGFIELD, ILL. (9ZS).—Strike out all particulars.

URBANA, ILL. (9XJ).—W. l., 375, variable.

WASHINGTON, D. C. (3XZ).—W. l., 175, 200, 260, 330; address, 542 Irving Street.

DEPARTMENT OF COMMERCE AND COMMUNICATIONS, BUREAU OF POSTS, P. I.

Coastal radio telegraph stations owned and operated by the Philippine Insular Government, Manila.

[This data is supplemental to the List of Radio Stations of the United States, edition June 30, 1922.]

Station.	Location (longitude latitude).	Call letters.	Primary power (kilowatts).	Type of transmitter.	Type of receiver (auditory).	Wave lengths (meters).	Nature of service.	Regular office hours.	Sunday and holiday hours.	Ship schedule.
Cuyo.....	121° 00' 00" E. 10° 50' 00" N.	KIX	2	Telefunken.....	Telefunken.....	600-1800.....	Public..	8 a. m. to 12 m., 2 to 5.30 p. m.	8 to 10 a. m., 4 to 5.30 p. m.	0.15 to 0.25 of every hour. First 10 minutes of every hour. 0.15 to 0.25.
Davao.....	125° 30' 00" E. 7° 00' 00" N.	KIF	3	do.....	do.....	600-1200.....	do.....	do.....	do.....	0.30 to 0.40.
Isabela de Basilan.....	121° 50' 50" E. 6° 40' 00" N.	KPN	(1)	Electro Import Co.	Electro Import Co.	200.....	do.....	do.....	do.....	0.15 to 0.25.
Jolo.....	121° 00' 00" E. 6° 10' 00" N.	KIL	2	Marconi.....	Marconi.....	600-1200-1900.....	do.....	do.....	do.....	0.30 to 0.40.
Malabang.....	124° 05' 00" E. 7° 00' 00" N.	KIZ	3	Composite.....	W. S. Co.	600-1200.....	do.....	do.....	do.....	0.15 to 0.25.
Puerto Princessa.....	118° 40' 00" E. 9° 40' 00" N.	KIV	2	Telefunken.....	Telefunken.....	600-1800.....	do.....	do.....	do.....	0.30 to 0.40.
San Jose, Mindoro.....	121° 00' 00" E. 12° 20' 00" N.	KIY	2	Marconi.....	Marconi.....	600-1200.....	do.....	do.....	do.....	Do.
Zamboanga.....	122° 03' 00" E. 6° 50' 00" N.	KIW	5	Composite.....	W. C. Co.	1220.....	do.....	7 a. m. to 8 p. m.	7 a. m. to 7 p. m.	First 10 minutes of every hour. Do.
Batangas.....	121° 00' 00" E. 13° 47' 00" N.	KPC	20	Marconi.....	Marconi.....	2700.....	do.....	do.....	do.....	Do.
Iloilo.....	122° 30' 00" E. 10° 40' 00" N.	KPM	5	do.....	do.....	600-1800.....	do.....	do.....	do.....	0.45 to 0.55.
Cebu.....	123° 50' 00" E. 10° 18' 00" N.	KPI	5	do.....	do.....	600-1800.....	do.....	do.....	do.....	0.30 to 0.40 of every hour. 0.45 to 0.55 of every hour.
Malangas.....	120° 05' 00" E. 7° 42' 00" N.	KPV	2	do.....	Marconi (old type)	600-900.....	do.....	8 a. m. to 12 m., 2 to 5.30 p. m.	8 to 10 a. m., 4 to 5.30 p. m.	0.15 to 0.25 of every hour.
Cullion.....	120° 02' 00" E. 11° 50' 00" N.	KPJ	1	do.....	W. S. Co.	600-1800.....	do.....	do.....	do.....	0.15 to 0.25 of every hour.
San Francisco Camotes.	124° 22' 00" E. 10° 38' 00" N.	KPY	4	do.....	do.....	300-800.....	do.....	do.....	do.....	0.45 to 0.55 of every hour.
Maifla.....	125° 30' 00" E. 6° 22' 00" N.	KPW	1	do.....	do.....	600-1800.....	do.....	do.....	do.....	0.15 to 0.25 of every hour.
Amugulis.....	122° 40' 00" E. 13° 15' 00" N.	KPB	2	do.....	do.....	600-1800.....	do.....	do.....	do.....	0.15 to 0.25 of every hour.
Matl.....	126° 17' 00" E. 6° 57' 00" N.	KPZ	1	do.....	do.....	600-922.....	do.....	do.....	do.....	Do.

1 40-watt battery.

Coastal radio telegraph stations owned and operated by the Philippine Insular Government, Manila—Continued.

Station.	Location (longitude latitude).	Call letters.	Primary power (kilowatt(s)).	Type of transmitter.	Type of receiver (auditory).	Wave lengths (meters).	Nature of service.	Regular office hours.	Sunday and holiday hours.	Ship schedule.
Lebak.....	124° 05' 00" E.	KPX	2	Marconi.....	W. S. Co.....	600-932-1200..	Public..	8 a. m. to 12 m., 2 to 5.30 p. m.	8 to 10 a. m., 4 to 5.30 p. m.	0.30 to 0.40 of every hour.
Siasi.....	8° 35' 00" N. 120° 49' 15" E.	KED	1	do.....	do.....	600.....	do.....	do.....	do.....	Do.
Bongao.....	5° 32' 45" N. 119° 46' 00" E. 5° 2' 00" N.	KEO	1	do.....	do.....	600-932.....	do.....	do.....	do.....	0.15 to 0.25 of every hour.

The first 2 minutes of each of the 10-minute periods shown above shall be devoted by the respective coastal stations to "listen in" for ship signals at 600 meters wave length and the rest to the exchange of radiograms should there be any. Should there be no message to be transmitted to or received from any ship, the coastal station shall go ahead with its regular schedule with other coastal stations. Should the exchange of radiograms be not finished within the prescribed 10-minute period, the coastal station operator may extend the period until all radiograms shall have been transmitted, provided that such procedure shall, in his judgment, not delay other business too long, otherwise the ship station shall be advised that the exchange of radiograms may be resumed on the next hour.—*Extract from Administrative Order No. 35, dated December 14, 1921, regarding ship schedule.*

MISCELLANEOUS.

RADIO FOG-SIGNAL STATIONS OPERATED BY LIGHTHOUSE SERVICE.

Stations for transmitting fog signals now in commission are Ambrose Channel Light Vessel, Fire Island Light Vessel, Sea Girt (N. J.) Light Stations, and San Francisco (Calif.) Light Vessel. The three stations first named were selected so as to enable vessels approaching or leaving New York to locate themselves conveniently by cross bearings and to furnish convenient leading marks to approach the harbor. The stations are identified by the characteristics of the signals. Thus, Ambrose Channel sends one dash, Fire Island a group of two dashes, Sea Girt a group of three dashes, and San Francisco a group of two dashes, with brief intervals between the groups. The particular station on which a radio bearing is being taken in a fog is by this means just as definitely known as is the light on which a sight bearing is taken by the navigator of a ship identified by its color of flashes or color. The signals are operated continuously during thick or foggy weather, and also at the present time they are sent each day from 9 to 9.30 a. m. and from 3 to 3.30 p. m., so as to permit any vessel equipped with radio compass to try out the method and apparatus in clear weather. To avoid continuous interference between the signals themselves, they are sent on different time schedules, as follows: Ambrose sends for 20 seconds, silent 20 seconds; Fire Island sends for 25 seconds, silent 25 seconds; Sea Girt sends for 60 seconds, silent 6 minutes; and San Francisco sends for 30 seconds, silent 30 seconds. The signals are repeated rapidly, Sea Girt, for example, sending over 40 groups of dashes a minute.

The transmitting apparatus now in use is a commercial panel type transmitting set of simple and rugged construction of about 1-kilowatt power. In addition to this set a special automatic motor-driven timing switch for producing the desired signal at regular intervals is provided. The antennas at the transmitting stations are the same as used for ordinary communication. The wave length used at present is 1,000 meters, the present international standard for such signals, and the range of usefulness varies from 30 to 100 miles, depending upon the sensitiveness of the receiving apparatus.

About the middle of this month a new light vessel will be placed in commission on Diamond Shoals, which will be provided with fog-signal apparatus, transmitting signals of two dashes grouped, 30 seconds on 30 seconds silent.

The following-named stations are expected to be placed in operation about the first of next year: Nantucket (Mass.) Light Vessel, Boston (Mass.) Light Vessel, Cape Charles (Va.) Light Vessel, Cape Henry (Va.) Light Station at entrance of Chesapeake Bay, Swiftsure Bank Light Vessel at entrance to Straits of Juan de Fuca, Wash., and Columbia River (Oreg.) Light Vessel at entrance of Columbia River. Further particulars regarding these stations may be had by communicating with the Commissioner of Lighthouses, Department of Commerce, Washington, D. C.

NEW LIST OF RADIO STATIONS OF THE UNITED STATES.

Copies of the new list of Commercial and Government Radio Stations of the United States, edition June 30, 1922, will be ready for distribution about the 15th of October and may be procured from the Superintendent of Documents, Government Printing Office, this city, at 15 cents per copy. The new list of Amateur Radio Stations of the United States will be ready for distribution about the same time or a few weeks later. The price of this publication is 15 cents per copy. A list of the broadcasting stations in operation on June 30 last will be included in the first-named publication. The list of experimental stations, technical and training school stations, and special amateur stations (special land stations) will be in both publications.

CHANGE IN RATES FOR CANADIAN STATIONS.

Beginning July 1 last the through wireless rate via the radio stations at Montreal, Grosse Isle, and Father Point will be 10 cents per word (6 cents coast tax and 4 cents ship tax). In addition to the above-mentioned stations the rate of the following-

named stations will be 10 cents per word, effective on the same date: Gonzales Hill, Cape Laxo, Point Grey, Pachena, Estevan British Columbia, Bull Harbour, Dead Tree Point, Digby Island, and Alert Bay.

LEGAL TIME IN POLAND.

Effective June 1 last the legal time in Poland will be the same as that of Central Europe.

BEARINGS OBTAINABLE FROM FRENCH STATIONS.

French radio compass stations in Algeria, France, and Morocco give bearings on 450, 600, or 800 meters, as the ship station may desire. For each bearing a charge of 6 francs is made. American ship stations should obtain these bearings on the 800-meter wave.

WIRELESS STATION AT MOSCOW, RUSSIA.

The new wireless station at Shabolevka, in Moscow, was able to receive messages from the recent Conference at Genoa. Messages are sent by the commissariat for foreign affairs through this station. The receiving department is equipped with three apparatus, all of Russian construction. The station has two masts each 560 feet high.

INFORMATION FROM THE BERNE INTERNATIONAL BUREAU.

Corsica.—The wireless coast station at Bonifacio will communicate with any ship desiring information of meteorological order relative to barometrical pressure, wind (direction and velocity), condition of the sky, barometrical tendency, and the visibility and condition of the sea. The land line telegraph rate is 3 cents per word and the coast station rate is 8 cents per word.

France.—The same information (given by Bonifacio) is obtainable from the station at Marseille. The rate is the same.

Poland.—Effective June 1 last, the legal time of this country will be the same as that of Central Europe.

WIRELESS TELEPHONY IN JAPAN.

Considerable interest is now being manifested in wireless telephony. The first wireless telephone to be established will communicate between Fukuoka in Kyushu and Fusan, Morea. It is planned to connect this line with land lines. Considerable delay has been experienced in its installation, but the station, from latest reports, should be in operation at this writing. The next installations planned by the Department of Communications of Japan are from Kyushu to Formosa and from Kyushu to Tsushima in the south and from Hokkaide to Saghalien in the north. A company is now being formed to establish a wireless telephone system between Kagoya and Osaka, a distance of about 120 miles.

AMPLIFIER USING ALTERNATING-CURRENT SUPPLY.

There has been developed at the Bureau of Standards an amplifier which uses 60-cycle alternating current to supply power for both the filaments and plates. The necessity for storage batteries and dry batteries is thus eliminated. The final form of amplifier uses five tubes and a crystal detector, there being three radio-frequency stages and two audio-frequency stages. A description of this amplifier is contained in a paper by P. D. Lowell, "Note on the development of an electron tube amplifier which uses 60-cycle alternating current to supply power for the filaments and plates," which appeared in the July, 1922, issue of the Journal of the American Institute of Electrical Engineers, volume 41, pages 488-490. It is expected that this paper will also be available as a publication of the Bureau of Standards in a few months. A more extended notice will appear in the Radio Service Bulletin when the Bureau of Standards publication is available.

SOURCES OF RADIO INFORMATION.

Many inquiries for radio information are received at the radio laboratory of the Bureau of Standards. A considerable part of these inquiries call for the same kinds of elementary information regarding radio publications, radio laws and regulations, station and operator licenses, and call books. In order to facilitate the handling of these inquiries, there has been prepared Bureau of Standards Circular No. 122, Sources of Elementary Radio Information. This circular gives the more important periodicals of radio interest, lists the more important Government radio publications and the radio books issued by various publishers which are of most general interest, and gives a brief summary statement regarding the radio laws and regulations and call letters. A copy of Bureau of Standards Circular No. 122 may be purchased for 5 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.

REFERENCES TO CURRENT RADIO PERIODICAL LITERATURE.

The following list of references is prepared by the radio laboratory of the Bureau of Standards and is intended to cover the more important papers of interest to the professional radio engineer which have recently appeared in technical periodicals. Abstracts and articles which are essentially of amateur or novice interest are not noted. For about two years these lists have been prepared in mimeographed form, and a very limited number of copies have been available for distribution. Recently there has arisen a very considerably increased demand, and it has seemed desirable to publish the list in the Radio Service Bulletin. The publication of these references will be continued if the readers of the Radio Service Bulletin find them useful. The Bureau of Navigation will be pleased to receive suggestions from readers as to the desirability of continuing their publication. A complete file of the previous mimeographed lists can be consulted at the Bureau of Standards in Washington. Files of these lists can also be consulted at the Library of Congress in Washington, the Engineering Societies Library in New York, and the John Crerar Library in Chicago.

These references are classified according to a decimal system outlined in a report prepared at the radio laboratory of the Bureau of Standards, an extension of the Dewey decimal classification applied to radio. It is expected that this classification will be published later. In this list the subjects corresponding to the 10 principal classes of the radio classification are given, and preceding each reference is a given number which corresponds to the classification of the reference. The subjects corresponding to the various decimal divisions of the 10 principal classes are not given in these lists, but can be found in the classification. In case a reference could properly be assigned to two or more of the numbers of the classification, it appears only once in this list, with the number corresponding to the subject in connection with which the reference is of greatest importance. In this list, under the first eight principal classes, the numbers assigned to the references are preceded by the letter "R," which is an abbreviation for the number 621.384 which is assigned to radio communication in the regular Dewey decimal classification. Under the class "R 800—Non-radio subjects," the numbers shown in this list are not preceded by an "R," but are the numbers assigned to the subject of the reference in the regular complete Dewey classification.

R000.—Radio communication.

- R007.1 Terrell, W. D., A few ideas on radio. Radio Broadcast, 1, pp. 330-331, August, 1922.
- R007.1 The new radio bill: Introduced in Senate by Senator Kellogg (S3694) and in House by Representative White (HR11964). QST, 5, p. 32, July, 1922.

- R007.5 Revision of British post-office regulations covering amateur transmission. *Wireless Age*, 9, p. 79, July, 1922.
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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name	=Name of station.
Loc.	=Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call	=Call letters assigned.
System	=Radio system used and sparks per second.
Range	=Normal range in nautical miles.
W. l.	=Wave lengths assigned: Normal wave lengths in italics.
Service	=Nature of service maintained:
	PG=General public.
	PR=Limited public.
	RC=Radio compass station.
	P=Private.
	O=Government business exclusively
Hours	=Hours of operation.
	N=Continuous service.
	X=No regular hours.
	m=a. m. (12 m=midday).
	s=p. m. (12s=midnight).
Rates	=Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co.	=Independent Wireless Telegraph Co.
R. C. A.	=Radio Corporation of America.
S. O. R. S.	=Ship Owners' Radio Service.
C. w.	=Continuous wave.
I. c. w.	=Interrupted continuous wave.
V. t.	=Vacuum tube.
FX.	=Fixed station.

CERTIFICATE: By direction of the Secretary of Commerce this publication is issued as an administrative report and is required for the proper transmission of the public business.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Katalla, Alaska ¹	KSC	300, 550, 600.....	PG & PP	X	Chilkat Oil Co.
Oakland, Calif. ²	KGA	250.....	Y	X	Tribune Publishing Co.
San Francisco, Calif. ³	KII	.....	P	X	United Press.
Do. ⁴	KTA	300, 540, 600.....	P	X	Examiner Printing Co.

¹ Loc. (approx.) 0.144° 30' 00", N. 60° 10' 00"; range, 150; system, Telefunken, 1000; rates, ship service, 6 c. per word; station to station, 6 c. per word (minimum, 60 c.), domestic count; night message, 5 c. per word (minimum, 50 c.), domestic count; night letter 60 c. for 50 words and 12 c. for each additional 10 words or fraction thereof.

² System, v. t. telegraph.

³ Range, 200; system, composite, v. t. telephone and telegraph; rates, none. All of the above-named stations, with the exception of Katalla, Alaska, are portable.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.	Service.	Hours.	Owner of vessel.	Station controlled by—
		<i>Cents.</i>				
Bella ¹	WAX	.....	PG	X	Antonio Carozza.....	I. W. T. Co.
Blue Hill.....	KFEA	8	PG	X	L'Hote S. S. Co.....	R. C. A.
Gaston ²	KFCE	6	PG	X	Pensacola Shipbuilding Co.	Owner of vessel.
John A. Kling ³	KFEI	.....	PG	X	Rockport S. S. Co.....	R. C. A.
Lincoln Land ⁴	KUFL	.....	PG	X	Indian Transportation & Navigation Co.	
Nepenthe II.....	KFBR	.....	.....	.....	Van Campen Heilner.....	
Niagara ⁵	KFEE	.....	PG	X	American S. S. Co.....	Owner of vessel.

¹ Range, 200; system, Marconi, 120; w. l., 300, 600.

² Range, 150; system, Navy-Simon, 1000; w. l., 300, 600.

³ Range, 150; system, RCA, 1000; w. l., 300, 600; rates, Great Lakes, 2 c. per word.

⁴ Range, 200; system, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.

⁵ Range, 150; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 600; rates, Great Lakes, 2 c. per word.

Commercial land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KFBR	Nepenthe II.....b	KII	San Francisco, Calif. (portable).....c
KFCE	Gaston.....b	KSC	Katalla, Alaska.....c
KFEA	Blue Hill.....b	KTA	San Francisco, Calif. (portable).....c
KFEE	Niagara.....b	KUFL	Lincoln Land.....b
KFEI	John A. Kling.....b	WAX	Bella.....b
KGA	Oakland, Calif. (portable).....c		

Broadcasting stations, alphabetically by names of cities.

[Additions to the List of Radio Stations of the United States, edition June 30, 1922.]

City.	Call signal.	City.	Call signal.
Abilene, Tex.	WQAQ	Liberal, Kans.	WMAG
Amarillo, Tex.	WRAU	Lockport, N. Y.	WMAK
Ardmore, Okla.	WOAA	Louisville, Ky.	WLAP
Bellows Falls, Vt.	WLAK	Marshalltown, Iowa.	WLAR
Boston, Mass.	WNAC	Minneapolis, Minn.	WLAG
Bowling Green, Ky.	WNAB	New York, N. Y.	WLAW
Burlington, Iowa.	WLAT	Norman, Okla.	WNAD
Cazenovia, N. Y.	WMAC	Oklahoma, Okla.	WMAB
Chicago, Ill.	WLAG	Pensacola, Fla.	WLAU
Do.	WMAQ	Phoenix, Ariz.	KFCB
Columbus, Ohio.	WMAN	Prescott, Ariz.	KFBQ
Cresco, Iowa.	WNAG	Richmond, Va.	WMAS
Dartmouth, Mass.	WMAF	Salem, Oreg.	KFCD
Duluth, Minn.	WMAT	San Antonio, Tex.	WOAI
Easton, Pa.	WMAF	Scranton, Pa.	WLAO
Enid, Okla.	WNAF	Springfield, Ohio.	WLAM
Fairbanks, Alaska	WLAY	Trenton, N. J.	WMAL
Fremont, Nebr.	WOAE	Trinidad, Colo.	KFBS
Greencastle, Ind.	WLAX	Tulsa, Okla.	WLAL
Houlton, Me.	WLAN	Wallace, Idaho.	KFCC
Houston, Tex.	WPAU	Waterloo, Iowa.	WMAR
Hutchinson, Kans.	WLAS	Warren, Ohio.	WLAZ
Kalamazoo, Mich.	WLAQ	Washington Court House, Ohio.	WGAX
Kansas City, Mo.	WMAJ	Wilkes-Barre, Pa.	WNAH
Laramie, Wyo.	KFBU		

Lists of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 and 400 meters), alphabetically by call letters.

[Additions to the List of Radio Stations of the United States, edition June 30, 1922.]

Call signal.	Station operated and controlled by—	Location of station.	Wave lengths.
KFBQ	Savage Electric Co.	Prescott, Ariz.	360
KFBS	Trinidad Electric & Supply Co.	Trinidad, Colo.	360
KFBU	The Cathedral (Bishop Thomas).	Laramie, Wyo.	360
KFCB	Nielsen Radio Supply Co.	Phoenix, Ariz.	360
KFCC	Auto Supply Co.	Wallace, Idaho.	360
KFCD	Salem Electric Co.	Salem, Oreg.	360
WGAX	Radio Electric Co.	Washington Court House, Ohio.	360
WLAG	Cutting & Washington Radio Corp.	Minneapolis, Minn.	360
WLAK	Vermont Farm Machine Corp.	Bellows Falls, Vt.	360
WLAL	Tulsa Radio Co.	Tulsa, Okla.	360
WLAM	Morrow Radio Co.	Springfield, Ohio.	360
WLAN	Putnam Hardware Co.	Houlton, Me.	360
WLAO	Anthracite Radio Shop.	Scranton, Pa.	360
WLAP	W. V. Jordan.	Louisville, Ky., 306 West Breckenridge Street.	360
WLAQ	A. E. Schilling.	Kalamazoo, Mich., 906 North Park Street.	360
WLAR	Mickel Music Co.	Marshalltown, Iowa.	360
WLAS	Hutchinson Grain Radio Co.	Hutchinson, Kans.	360, 485
WLAT	Charles G. Bosch Co.	Burlington, Iowa.	360
WLAV	Electric Shop.	Pensacola, Fla.	360
WLAW	Police Department of New York City.	New York, N. Y.	360
WLAX	Putnam Electric Co.	Greencastle, Ind.	360
WLAY	Northern Commercial Co.	Fairbanks, Alaska.	360
WLAZ	Hutton & Jones Electric Co.	Warren, Ohio.	360
WMAB	Radio Supply Co.	Oklahoma, Okla.	360
WMAC	J. Edw. Page (Clive B. Meredith).	Cazenovia, N. Y., Fernwood Street.	360
WMAF	Round Hills Radio Corp.	Dartmouth, Mass.	360
WMAG	Tucker Electric Co.	Liberal, Kans.	360
WMAJ	Drovers Telegram Co.	Kansas City, Mo.	360, 485
WMAK	Norton Laboratories.	Lockport, N. Y.	360
WMAL	Trenton Hardware Co.	Trenton, N. J.	360
WMAN	Broad Street Baptist Church.	Columbus, Ohio.	360
WMAP	Utility Battery Service.	Easton, Pa.	360
WMAQ	The Fair Corporation and Chicago Daily News.	Chicago, Ill.	360
WMAR	Waterloo Electrical Supply Co.	Waterloo, Iowa.	360
WMAS	Radio Equipment Co.	Richmond, Va.	360
WMAT	Paramount Radio Corp.	Duluth, Minn.	360

Lists of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (260 and 400 meters), alphabetically by call letters—Continued.

Call signal.	Station operated and controlled by—	Location of station.	Wave lengths.
WNAB	Park City Daily News.....	Bowling Green, Ky.....	360
WNAC	Shepard Stores.....	Boston, Mass.....	300
WNAD	Oklahoma Radio Engineering Co.....	Norman, Okla.....	300
WNAF	Enid Radio Distributing Co.....	Enid, Okla.....	360, 485
WNAH	Rathert Radio & Electric Shop.....	Cresco, Iowa.....	300
WNAH	Wilkes-Barre Radio Repair Shop.....	Wilkes-Barre, Pa.....	300
WOAA	Dr. Walter Hardy.....	Ardmore, Okla.....	300
WOAE	Midland College.....	Fremont, Nebr.....	300
WOAI	Southern Equipment Co.....	San Antonio, Tex.....	300
WPAN	Levy Bros. Dry Goods Co.....	Houston, Tex.....	300
WQAU	West Texas Radio Co.....	Abilene, Tex.....	300
WIRAU	Amarillo Daily News.....	Amarillo, Tex.....	300

Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Alexander Hamilton.....	NIVS	U. S. Coast Guard.
Sturgeon Bay ¹	NITZ	U. S. Navy.
Illinois ²	WYAX	U. S. Army.

¹ System, U. S. Navy; w. l., 300, 600.

² System, U. S. Army.

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922.]

Station.	Call signal.	Wave lengths.	Station controlled by—
Camp Hill, Pa.....	3ZD	200, 375.....	J. Cox Thompson.
Cape Girardeau, Mo.....	9Y AQ	200, 375.....	Southeast Missouri State Teachers College.
Cazenovia, N. Y.....	8XH	220, 275, 375.....	Clive B. Merodith.
Chicago, Ill.....	9XO	Variable.....	Morkum Co.
Cleveland, Ohio.....	8XM	200, 275.....	City Water Department.
Dartmouth, Mass.....	1XV	Variable.....	Round Hills Radio Corp.
East Pittsburgh, Pa.....	8XS	Variable.....	Westinghouse Electric & Manufacturing Co.
Eldorado, Kans.....	9XP	Variable.....	Midland Refining Co. (G. L. Carrington).
El Paso, Tex.....	5ZACA	200, 375.....	Mine & Smelter Supply Co.
Enid, Okla.....	5ZAL	200, 375.....	Kenneth B. Griffin, 30 Day Building.
Lexington, Ky.....	9ZI	200, 375.....	Ray E. Anderson, 707 Franklin Avenue.
Los Angeles, Calif.....	6XY	Variable.....	Earl C. Anthony (Inc.), 1900 South Hope Street.
Memphis, Tenn.....	5ZABA	200, 375.....	John C. Flippin, 534 Pontotoc Avenue.
Montgomery, Ala.....	5XABA	200, 375.....	Paul B. Brooks, 400 South McDonough Street.
New York, N. Y. (Municipal Building).	2XW	Variable.....	Western Electric Co.
Pine Bluff, Ark.....	5XAI	200, 375.....	Arkansas Light & Power Co.
Stockbridge, Mass.....	1XU	Variable.....	Thomas S. L. Ketcha.
Syracuse, N. Y.....	8XI	275.....	Andrew J. Potter, 212 Westminster Avenue.
Tucson, Ariz. (portable).	6XZ	Variable.....	R. D. Whitacre and L. R. Wilson, 417 East Speedway.
Washington, D. C.....	3ZHH	150-375.....	Herbert Hoover, jr., 2200 S Street NW.
Wichita Falls, Tex.....	5ZADA	200, 375.....	Lundy L. Zeigler, 2007 Huff Avenue.

Special land stations, grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
1XU	First district:	6XY	Sixth district:
1XV	Stockbridge, Mass.	6XZ	Los Angeles, Calif.
2XW	Dartmouth, Mass.		Tucson, Ariz. (portable).
	Second district: New York, N. Y.		Eighth district:
3ZD	Third district:	8XH	Cazenovia, N. Y.
3ZH	Camp Hill, Pa.	8XI	Syracuse, N. Y.
	Washington, D. C.	8XM	Cleveland, Ohio.
	Fifth district:	8XS	East Pittsburgh, Pa.
5XABA	Montgomery, Ala.		Ninth district:
5XAI	Pine Bluff, Ark.	9XO	Chicago, Ill.
5ZABA	Memphis, Tenn.	9XP	El Dorado, Kans.
5ZACA	El Paso, Tex.	9YAO	Cape Girardeau, Mo.
5ZADA	Wichita Falls, Tex.	9ZI	Lexington, Ky.
5ZAL	Enid, Okla.		

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

CAPE MAY, N. J.—W. 1., 300, 525, 600, 1610; service, PG & PR; PR service is with Marion, Mass., on 1610 meters.

CHICAGO, ILL.—Strike out all particulars.

CHICHAGOF, ALASKA.—Range, 200; service, PG & PR.

DALLAS, TEX. (KUXP).—Strike out all particulars.

FAIRPORT, VA.—Hours, X.

FLAT ROCK, MICH.—Strike out all particulars.

FORT WORTH, TEX. (KDMK).—Strike out all particulars.

GALVESTON, TEX. (KDLZ).—Strike out all particulars.

MANITOWOC, WIS.—Hours, N.

MARSHALL, ALASKA.—Strike out all particulars.

MEXIA, TEX.—Strike out all particulars.

NAKAT INLET, ALASKA.—Strike out all particulars.

NEW ORLEANS, LA.—System, composite v. t. and composite spark, 1000.

NEW YORK, N. Y. (WNY).—Read New York, N. Y. (Borough of Brooklyn); w. 1., 300, 600.

NEW YORK, N. Y. (WSK).—Strike out all particulars.

NORFOLK, NEBR.—Strike out all particulars.

ORANGE, TEX.—Strike out all particulars.

ORANGE FIELD, TEX.—Strike out all particulars.

SKAGIT POWER SITE, WASH.—Range, 150; w. 1., 300, 425, 500, 600.

SEATTLE, WASH. (KVV).—W. 1., 300, 425, 500, 600.

SUGARLAND, TEX.—Strike out all particulars.

SWANS ISLAND, ME.—Strike out all particulars.

TULSA, OKLA. (KDGT).—Strike out all particulars.

TULSA, OKLA. (WBAT).—Strike out all particulars.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

NOTE.—(U. S. L.) after operating company denotes that the change applies to the List of Radio Stations of the United States only; does not apply to the Berne list. Hereafter where the rate is given without the service specifically stated—that is, North and South American and transoceanic services—it should be understood that the rate is for both classes of service. When the rate is for one class of service only, the class of service will be stated.

AGWISUN.—W. 1., 300, 450, 600.

AQUARIUS.—Range, 200; system, Kilbourne & Clark, 1000; w. 1., 300, 600; hours, X.

AMERICAN LEGION.—Range, 500; w. 1., 300, 450, 600, 1800.

ANACONDA.—System, Navy-Wireless Improvement Co., 1000.

ARCADIA.—Strike out all particulars.

BAYOU CHICO.—Range, 300; system, Navy-Lowenstein, 1000; w. 1., 300, 450, 600.

- BROAD ARROW.—Hours, X.
 CALORIA.—Vaccaro Bros. & Co., owner of vessel.
 CARL D. BRADLEY.—System, R. C. A., v. t. telephone, c. w., i. c. w., and spark, 1000.
 CASCO.—Strike out all particulars.
 CATHAY.—Name changed to Diana Dollar; hours, X.
 CHEBAULIP.—W. I., 300, 450, 600.
 CITY OF LOS ANGELES.—Station operated and controlled by R. C. A.; effective September 11, 1922.
 COAHOMA COUNTY.—W. I., 300, 450, 600.
 COAMO.—Strike out all particulars.
 COL. E. L. DRAKE.—Range, 300; system, R. C. A., 1000.
 COSTILLA.—M. and J. Tracy, owners of vessel.
 COTE BLANCHE.—Name changed to Michael Tracy; M. and J. Tracy, owners of vessel.
 COTTONWOOD.—System, Navy-R. C. A., 1000; James Davidson, owner of vessel.
 COUSHATTA.—M. and J. Tracy, owners of vessel.
 COURTOIS.—Station operated and controlled by R. C. A. (U. S. L.).
 COVALT.—Morton Salt Co., owner of vessel.
 COWEE.—Name changed to Makaweli; station operated and controlled by R. C. A., effective July 29, 1922; Matson Navigation Co., owner of vessel.
 EASTERN COAST.—Range, 300; system, Marconi, 1000; w. I., 300, 450, 600.
 EASTERN GLEN.—System, Navy-R. C. A., 1000; hours, X.
 EASTERN KING.—System, Navy-Marconi, 1000; w. I., 300, 450, 600.
 EASTERN PLANET.—Range, 500; w. I., 300, 450, 600, 1800; hours, X.
 EASTERN SHORE.—System, Navy-Marconi, 1000; w. I., 300, 450, 600; hours, X.
 EDGEFIELD.—W. I., 300, 450, 600; hours, X.
 EOCENE.—Standard Transportation Co., owner of vessel.
 F. D. ASCHE.—Strike out all particulars.
 HOMESTEAD.—W. I., 300, 450, 600; hours, X.
 HONOLULU.—Name changed to Commercial Trader.
 IDA.—Strike out all particulars.
 ILLINOIS (WCZ).—System, R. C. A., 1000.
 INVINCIBLE.—System, Navy-R. C. A., 1000; w. I., 300, 450, 600.
 ITALIA.—Name changed to Sucareco.
 ISONOMIA.—Strike out all particulars.
 LAKEBRIDGE.—E. K. Wood Lumber Co., owner of vessel.
 LAKE DUNMORE.—Name changed to El Cicuta; Erle M. Leaf, owner of vessel.
 LAKE FISHER.—Lake Fisher Navigation Co., owner of vessel.
 LAKE FORNEY.—Station operated and controlled by R. C. A.; effective September 14, 1922.
 LAKE GEORGE.—James Davidson, owner of vessel.
 LAKESHORE.—Station operated and controlled by R. C. A. (U. S. L.).
 LAKE SLAVI.—Range, 200; system, R. C. A., 1000; w. I., 300, 450, 600.
 MAJOR WHEELER.—Station operated and controlled by R. C. A., effective September 1, 1922.
 MAKENA.—Station operated and controlled by R. C. A., effective July 29, 1922.
 MONMOUTH.—Range, 300; system, R. C. A., 1000; w. I., 300, 450, 600; hours, X.
 NORMA.—Station operated and controlled by I. W. T. Co., effective September 15, 1922.
 PACIFIC.—Range, 300; system, R. C. A., 1000; w. I., 300, 600; station operated and controlled by R. C. A.
 PATROL.—Name changed to Macom; system, R. C. A., 1000; w. I., 300, 450, 600; service, PG; hours, X; rate, 8 c. per word.
 PAWNEE, (WLU).—Strike out all particulars.
 PEQUONNOCK.—Range, 150; system, Cutting & Washington, 1000; w. I., 300, 450, 600; hours, X; rate, 8 c. per word.
 PEQUOT.—Strike out all particulars.
 PERE MARQUETTE 8.—Service PG.
 PHILIP PUBLICKER.—Adelphia S. S. Corp., owner of vessel.
 PILGRIM.—Goodrich Transit Co., owner of vessel.
 PORTO RICO.—W. I., 300, 450, 600.
 POZNAM.—Name changed to Paul Luckenbach.
 REMUS.—Station operated and controlled by I. W. T. Co. (U. S. L.).
 SABOTAWAN.—W. I., 300, 450, 600.
 SCHODACK.—W. I., 300, 450, 600.
 SEEANDBEE.—System, R. C. A. v. t. telephone, c. w., i. c. w., and spark, 1000.
 SINASTA.—Station operated and controlled by I. W. T. Co. (U. S. L.).

SUTORPCO.—Range, 300; system, Navy-W. S. A. Co., 1000; w. l., 300, 450, 600.
THEODORE F. REYNOLDS.—Strike out all particulars.
TIPTON.—Baltimore & Carolina S. S. Co., owner of vessel.
TUNICA.—Strike out all particulars.
WEST ELCASCO.—System, Navy-Marconi, 1000; w. l., 300, 450, 600; hours, X.
WEST HARDAWAY.—Range, 200; system, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
WEST HEMBRIE.—System, Navy-Lowenstein, 1000; w. l., 300, 450, 600; hours, X; station operated and controlled by S. O. R. S., effective September 5, 1922.
WEST HOBOMAC.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
WEST HUMHAW.—System, Navy-Marconi, 1000; w. l., 300, 450, 600; hours, X.
WEST ISLAY.—Station operated and controlled by R. C. A. (U. S. L.).
WEST ISLETA.—W. l., 300, 600.
WEST LOQUASSUCK.—Station operated and controlled by S. O. R. S., effective September 5, 1922.
WEST MAHOMET.—System, Navy-Marconi, 1000; w. l., 300, 450, 600; hours, X.
WEST MUNHAM.—System, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
WEST NOMENTUM.—Range, 300; system, Navy-R. C. A., 1000; 300, 450, 600.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDIY, *read* El Cicuta; **KDWX**, *read* Diana Dollar; **KIN**, *read* Macom; **KUPB**, *read* Sucarseco; **WLY**, *read* Paul Luckenbach; **WMAO**, *read* Makaweli; **WMEE**, *read* Michael Tracy; **WMZ**, *read* Commercial Trader; strike out all particulars following the call signals, **KDDG**, **KDGT**, **KDLZ**, **KDLY**, **KDMK**, **KDW**, **KEL**, **KGA**, **KIS**, **KSUA**, **KUXP**, **WBAR**, **WBAS**, **WBAT**, **WCP**, **WFD**, **WFM**, **WJP**, **WKH**, **WLU**, **WLW**, **WLX**, **WQX**, **WSK**, **WTI**, **WWD**.

BROADCASTING STATIONS, BY CALL SIGNALS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922.]

KDYL (Salt Lake City, Utah).—W. l., 360, 485.
KDZJ (Eugene, Oreg.).—Station operated and controlled by Excelsior Radio Manufacturing Co.
KOQ (Modesto, Calif.).—Strike out all particulars.
KSD (St. Louis, Mo.).—W. l., 400, 485.
KYW (Chicago, Ill.).—W. l., 400, 485.
WAAE (St. Louis, Mo.).—Strike out all particulars.
WAAP (Wichita, Kans.).—Station operated and controlled by United Electric Co.
WBAY (New York, N. Y.).—W. l., 400.
WCX (Detroit, Mich.).—W. l., 400, 485.
WDAI (Syracuse, N. Y.).—W. l., 360, 485.
WEAF (New York, N. Y.).—W. l., 400.
WEAQ (Berlin, N. H.).—Strike out all particulars.
WFAA (Dallas, Tex.).—W. l., 400, 485.
WFAK (Brentwood, Mo.).—Strike out all particulars.
WGAC (Brooklyn, N. Y.).—Strike out all particulars.
WGAR (Fort Smith, Ark.).—W. l., 360, 485.
WGU (Chicago, Ill.).—Strike out all particulars.
WGY (Schenectady, N. Y.).—W. l., 400, 485.
WHAY (Huntington, Ind.).—W. l., 360.
WHAZ (Troy, N. Y.).—W. l., 400.
WJZ (Newark, N. J.).—W. l., 360, 485.
WOO (Philadelphia, Pa.).—W. l., 400, 485.
WOR (Newark, N. J.).—W. l., 400.
WOS (Jefferson City, Mo.).—W. l., 360, 485.
WWJ (Detroit, Mich.).—W. l., 400, 485.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

AMAGANSETT, N. Y. (regular station).—Strike out all particulars.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

VICKSBURG.—(NVN) Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals, NBM and NVN.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922.]

BALA, PA. (3ZA).—W. 1., 200, 375.
 BALTIMORE, MD. (3XAA).—Address 1616 Madison Avenue.
 BALTIMORE, MD. (3ZN).—Changed to Philadelphia, Pa., 2105 West Tioga Street.
 BERKELEY, CALIF. (6XK).—Strike out all particulars.
 BOSTON, MASS. (1YC).—W. 1., 200, 375.
 DEARBORN, MICH. (8XD).—Station operated and controlled by Ford Motor Co.
 DECATUR, GA. (4ZF).—Address 142 Adams Street.
 DENVER, COLO. (9ZAF).—Call signal erroneously given as 9ZAG in August bulletin (Reynolds Radio Co.).
 DENVER, COLO. (9ZD).—Strike out all particulars.
 DUNMORE, PA. (8ZQ).—Address 117 South Blakely Street.
 EAST PALESTINE, OHIO (8ZJ).—Strike out all particulars.
 INDEPENDENCE, MO. (9ZH).—Strike out all particulars.
 LEXINGTON, KY. (9YA).—Strike out all particulars.
 MADISON, WIS. (9XL).—W. 1., variable.
 MIDDLETOWN, CONN. (1XN).—W. 1., variable.
 MOBILE, ALA. (5XAE).—W. 1., 200, 375, 450.
 MUNCIE, IND. (9YR).—Strike out all particulars.
 NEW PHILADELPHIA, OHIO (8ZA).—Address 256 North Fifth Street.
 NEW YORK, N. Y. (2XK).—Station operated and controlled by Cockaday & Quinby, 1522 Jesup Avenue.
 NEW YORK, N. Y. (2XR).—W. 1., variable.
 NORTHVILLE, MICH. (8XL).—Station operated and controlled by Ford Motor Co.
 OLYMPIA, WASH. (7ZP).—Address 2201 Columbia Street.
 PORT ARTHUR, TEX. (5XV).—W. 1., 200, 375, variable.
 PULLMAN, WASH. (7ZS).—Address 701 State Street.
 SAN JOSE, CALIF. (portable) (6XE).—Address 467 South First Street.
 SHREVEPORT, LA. (5ZS).—W. 1., 200, 375; address 1513 Laurel Street.
 ST. LOUIS, MO. (9XS).—Strike out all particulars.
 VANCOUVER, WASH. (7ZK).—Address 406 West Twelfth Street.
 WASHINGTON, D. C. (3XO).—W. 1., 250.
 WASHINGTON, D. C. (3ZW).—W. 1., 150, 200, 275, 375.

MISCELLANEOUS.

BROADCASTING REGULATIONS AMENDED.

The specifications applying to class B radiotelephone broadcasting stations are amended to read as follows:

Music. The use of mechanically operated instruments is prohibited.

D. B. CARSON,
Commissioner of Navigation.

Approved:

HERBERT HOOVER,
Secretary of Commerce.

SEPTEMBER 22, 1922.

INFORMATION FROM THE BERNE INTERNATIONAL BUREAU.

Since August 1, this year, a radiotelegram service destined to vessels outside of the range of French coast stations is assured by the powerful station situated at Basse-Lande, Nantes, France. The address of all long-distance radiotelegrams must carry the name Basse-Lande as the name of the sending station. These telegrams are sent daily from 9 to 10 p. m. and, if necessary, from 4 to 5 p. m., Greenwich. Each message is transmitted twice and repeated the following day. This station does not guarantee the reception of ships.

The charges of long-distance telegrams are as follows: (a) Charges of ordinary telegrams. (b) Charges for radiotelegraph transmission, 1 franc 50 centimes per word. Ship charges are collected from the receiver of message, and the rate is 50 centimes per word.

The status of this station is as follows: Name of station, Basse-Lande; geographic position, $0.01^{\circ} 42' 00''$, N. $47^{\circ} 10' 40''$; call, U A; range, 1,500 miles; system, French Navy, spark 750; w. l., 2800; service, P R.

STATIONS IN ALASKA CLOSED FOR THE SEASON.

Alitak (KYL), closed September 15.
Chignik (KHC), closed September 7.
Chisik Island (KUCP), closed September 10.
Funter (KXK), closed September 20.
Kussiloff (KKAO), closed September 7.

ADDRESS OF I. W. T. CO. CHANGED.

The Independent Wireless Telegraph Co. is now located at 35 Water Street, New York, N. Y.

OPERATORS' LICENSES SUSPENDED.

During the past month two operators' licenses were suspended for operating with licenses that had expired. Operators are warned that similar action will be taken against anyone violating the regulations in this regard.

Details of time, weather, press, and hydrographic bulletins schedules broadcasted by Naval Communication Service.

Name of station.	Call letters.	Wave length.	Type of emission.	Time (75th meridian). ¹	Nature of service.
Alpena, Mich.....	NSM	1,200	Spark.....	0845 1145 1245 1445 1645 1845 2045	Weather. Do. Do. Do. Do. Do. Do.
Annapolis, Md.....	NSS	17,145	C. w.....	1155 1700	Time. Ice report.
Arlington, Va.....	NAA	5,950 2,650	C. w. spark.....	2155 1030 1155	Time, press. Weather, hydrographic. Time, storm warnings.
Balboa, Canal Zone....	NBA	10,110	C. w.....	2155 0455 1255	Time, weather, hydrographic, press. Time, press. Time.
Baltimore, Md.....	NBZ	700	Spark.....	1030 1600	Weather, hydrographic. Do.
Bar Harbor, Me.....	NBD	2,750	do.....	0300	Press.
Boston, Mass.....	NAD	1,620	do.....	1100 1155 1701	Weather, hydrographic. Time, if Arlington fails. Weather, hydrographic.
Buffalo, N. Y.....	NNZ	1,200	do.....	1045 1700 2245	Do. Do. Do.

¹ The time as shown in this table is given as from 1 to 24 o'clock in lieu of 1-12 a. m. and 1-12 p. m. For example, 0845 is 8.45 a. m.; 1200 is noon, 1145 is 2.45 p. m., etc.

13563°—22—2

Details of time, weather, press, and hydrographic bulletins schedules broadcasted by Naval Communication Service—Continued.

Name of station.	Call letters.	Wave length.	Type of emission.	Time (75th meridian).	Nature of service.
Cavite, P. I.....	NPO	5,200	C. w.....	0855	Time.
				2155	Do.
		2,700	Spark.....	0855	Do.
				2155	Do.
Charleston, S. C.....	NAO	2,250	do.....	1030	Weather, hydrographic.
				1155	Time, if Arlington fails.
Cleveland, Ohio.....	NRH	1,080	do.....	1800	Weather, hydrographic.
				1100	Do.
				1730	Do.
				2300	Do.
Colon, Canal Zone.....	NAX	1,620	do.....	0455	Time, hydrographic, press.
				1255	Do.
Duluth, Minn.....	NUX	1,200	do.....	1045	Weather, hydrographic.
				1645	Do.
Dutch Harbor, Alaska.	NPR	2,250	do.....	0030	Do.
				1230	Do.
Eureka, Calif.....	NPW	2,650	do.....	1200	Do.
				1455	Time.
				1700	Weather.
				2030	Do.
Galveston, Tex.....	NKB	1,813	do.....	1130	Weather, hydrographic.
				1800	Do. ¹
Great Lakes, Ill.....	NAJ	1,988	do.....	1100	Do.
				1155	Time, weather.
				1730	Weather, hydrographic.
				2300	Do.
				2330	Do.
Guantanamo, Cuba....	NAW	1,870	do.....		Hurricane warnings as issued every four hours.
Honolulu, Hawaii.....	NPM	2,250	do.....	0130	Weather, hydrographic.
				1330	Do.
				1730	Do.
				1855	Time.
				1855	Do.
Key West, Fla.....	NAR	11,500	C. w.....	1155	Do.
		1,988	Spark.....	2155	Time, press.
Miami, Fla.....	NGE	1,620	do.....	1130	Weather.
				1800	Do. ¹
New Orleans, La.....	NAT	1,832	do.....	1100	Weather, hydrographic.
				1155	Time.
				1700	Weather, hydrographic. ¹
Newport, R. I.....	NAF	1,908	do.....	1155	Time, if Arlington fails.
New York, N. Y.....	NAH	1,832	do.....	1030	Weather, hydrographic.
				1155	Time, if Arlington fails.
				1700	Weather, hydrographic.
Norfolk, Va.....	NAM	1,851	do.....	0830	Weather.
				1045	Weather, hydrographic.
				1155	Time, if Arlington fails.
				1600	Weather, hydrographic.
				2000	Weather.
				2030	Do. ²
		507	Spark and modulated c. w.		
North Head, Wash.....	NPE	2,700	Spark.....	0030	Do.
				0830	Do.
				1230	Do.
				1455	Time.
				1630	Weather, hydrographic.
				2030	Do.
				2330	Do.
Pensacola, Fla.....	NAS	2,250	do.....	1145	Do.
				1800	Do. ²
Philadelphia, Pa.....	NAI	1,948	do.....	1045	Do.
				1700	Do.
Point Isabel, Tex.....	NAY	2,250	do.....	0000	Weather. ¹
				1200	Do.
				1900	Do.
Port au Prince, Haiti..	NSC	2,250	do.....		Hurricane warnings as issued every four hours.
Portland, Me.....	NAB	800	do.....	1200	Weather
				2000	Do.
San Diego, Calif.....	NPL	9,800	C. w.....	0500	Press.
				1455	Time.
		1,988	Spark.....	1455	Do.

¹ Hurricane warnings as issued every two hours.

Details of time, weather, press, and hydrographic bulletins schedules broadcasted by Naval Communication Service—Continued.

Name of station.	Call letters.	Wave length.	Type of emission.	Time (75th meridian).	Nature of service.
San Francisco, Calif.	NPG	1,908	Spark	0055 0415 1455 2230	Time. Press. Time. Weather, hydrographic.
		4,650	C. w.	0055 0415 1200 1455	Time. Press. Weather, hydrographic. Time.
San Juan, P. R.	NAU	5,200	do.....	1000 2100	Hurricane warnings. Weather.
San Pedro, Calif.	NPX	1,851	Spark	1130 1700 2330	Do. Do. Do.
Savannah, Ga.	NEV	1,813	do.....	1100 1800	Do. Do.*
Seattle, Wash.	NVL	1,988	do.....	1600 2100	Hydrographic. Do.
St. Augustine, Fla.	NAP	1,851	do.....	1130 1900	Weather. Do.*
St. Croix, Virgin Is-lands.	NNI	450	do.....		Hurricane warnings as issued every four hours.
St. Petersburg, Fla.	NGL	2,700	do.....	1130 1900	Weather. Do.*
St. Thomas, Virgin Is-land.	NBB	1,688	do.....		Hurricane warnings as issued every four hours.
Tatoosh, Wash.	NPD	1,654	do.....	0800 1200 1600 2000 2300	Weather. Do. Do. Do. Do.
Tutuila, Samoa.	NPU	2,250	do.....	0230 1830 2230	Weather, hydrographic. Do. Do.

*Hurricane warnings as issued every two hours.

RADIO WEATHER BULLETINS, SWAN ISLAND, CARIBBEAN SEA.

The United States Weather Bureau has made arrangements with the United Fruit Co. for broadcasting and disseminating daily, beginning September 18, 1922, of special weather bulletins from the radio station located on Swan Island (United States) for the special benefit of shipping in the Caribbean Sea.

The a. m. bulletins will be in two parts. The first part will be broadcasted only during the hurricane season, June to November, inclusive, and will consist of weather observations taken at (approximately) 8 a. m., seventy-fifth meridian time (7 a. m. ninetyeth meridian time), at the following places which are indicated by key letters:

Swan Island.	SI	Port au Prince, Haiti.	PP
Belize, Honduras.	BZ	Cienfuegos, Cuba.	CFG
Bluefields, Nicaragua.	BFD	La Fe, Cuba.	LFE
Willemstadt, Curacao.	W	Kingston, Jamaica.	KN
San Juan, P. R.	SJ	Turks Island, Bahamas.	FI

The names of the stations, as well as the key letters, will be radioed from September 18 to October 15, 1922, inclusive, in order that shipmasters may identify the stations; after that time only the key letters will be used.

The key letters will be followed by a group of five figures showing barometric pressure, wind direction, and wind force. The first three figures express actual barometric readings, in inches, reduced to sea level. The fourth figure is wind direction: 1=north; 2=northeast; 3=east; 4=southeast; 5=south; 6=southwest; 7=west; 8=northwest; 0=calm. The fifth and last figures show wind force in the Beaufort Scale; except when winds of force greater than 9 occur words instead of figures will be used. If any portion of a report can not be furnished, such portion will be replaced by an equivalent number of letter "X." Example: SI 98643 (translated): Swan Island, barometer 29.86 inches, wind direction southeast, wind force 3.

The second part of the bulletin will consist of wind and weather forecasts for the western Gulf of Mexico (west of longitude 90°), eastern Gulf of Mexico (east of longitude 90°), the Caribbean Sea (west of longitude 73°), and for the Windward Passage.

Whenever the conditions warrant the forecasts will be preceded by advices and warnings regarding any storm or hurricane that may be in progress and of "northers" during the winter months. The second part of the bulletin will be broadcasted daily throughout the year.

A night bulletin based on observations taken at 8 p. m., seventy-fifth meridian time, will also be broadcasted daily throughout the year from Swan Island and will consist only of forecasts, advices, and warnings of the same character and for the same areas as are contained in the second part of the a. m. bulletin.

When a hurricane is in progress the Weather Bureau will issue advices regarding its location, direction, progress, and intensity at frequent intervals, and these advices will be broadcasted from Swan Island every two hours and on the even hour.

Swan Island (United States), 2,240 meters, spark 11.30 a. m. (ninetieth meridian time). Swan Island (United States), 2,240 meters, spark 10.45 p. m. (ninetieth meridian time).

The daily bulletins will be radioed by Swan Island from the Tropical Radio Telegraph Station at New Orleans (WNU) on 2,850 meters, spark at 10.30 a. m. and p. m., and any ship station is at liberty to pick up these messages and repeat them to other ships, should they desire to do so.

Beginning October 1, 1922, information displays will be made from the radio towers at Swan Island for the special benefit of ships in that region that are not equipped with radio. The signals will consist of large red pennant by day and a red lantern by night. These signals will indicate that important weather information regarding a hurricane or a "norther" is in the possession of the radio operator which can be obtained by boat calls ashore. However, ships equipped with radio that see the signals are permitted to call the Swan Island Station (United States) for the information. The United Fruit Co. also permits ships that fail to obtain the regular weather broadcasts to call the Swan Island Station at time for the latest weather forecasts.—*From Hydrographic Bulletin, September 27, 1922.*

DESIGN OF A PORTABLE SHORT-WAVE RADIO WAVE METER.

The Bureau of Standards has prepared a pamphlet of the above title for the use of persons occupied with radio experimentation. It is Letter Circular No. 78 of the Bureau of Standards, Department of Commerce. Like the other publications in the letter circular series, it is in mimeographed form and is not obtainable by purchase. A limited supply of these is available at the bureau to persons who have actual use for such information.

A wave meter is a device for measuring the frequency or the length of radio waves. Radio waves always travel with the same speed, and there is a definite wave length corresponding to every wave frequency. Amateur radio stations in the United States are at present required by law, when transmitting, to use wave lengths not exceeding 200 meters, and it is therefore important that amateur operators should have a wave meter available, so that they may adjust their transmitting sets to comply with the law, and it is necessary that this wave meter should be adapted to measure short wave lengths, such as 200 meters. Other comparatively short wave lengths, such as 360 and 485 meters, are now used for radio telephone broadcasting, and it is important to have a wave meter which can measure these wave lengths. The Radio Telephony Conference, which met in Washington in February, 1922, recommended narrow bands of waves for particular services, some bands being only 10 meters wide. Stations which must work within such narrow wave bands must be provided with well designed wave meters if they are to comply with the requirements of the law. The design of a portable short-wave wave meter is therefore a matter of importance. It is the purpose of this letter circular to point out important considerations in the design of such a wave meter and to describe the construction of a wave meter suitable for the measurement of frequencies from about 3,000 kilocycles per second to 530 kilocycles per second (wave lengths from 100 to 570 meters).

PUBLICATIONS ON SIMPLE CRYSTAL DETECTOR RADIO RECEIVING SETS.

Inquiries are received at the Bureau of Standards for information regarding the construction of a simple radio receiving set which can be constructed from materials easily obtainable.

The first of these, Bureau of Standards Circular 120, Construction and Operation of a Simple Home-Made Radio Receiving Outfit, describes a single-circuit crystal detector set having an inductor variable by steps and no condenser.

The second publication, Bureau of Standards Circular 121, Construction and Operation of a Two-Circuit Radio Receiving Equipment with Crystal Detector, describes a set equipped with a coupler and a variable condenser. This set has greater selectivity than the single-circuit set. The equipment used in constructing the single-circuit set can be used in constructing the two-circuit set.

Copies of these publications may be purchased for 5 cents each from the Superintendent of Documents, Government Printing Office, Washington, D. C.

REFERENCES TO CURRENT RADIO PERIODICAL LITERATURE.

The following list of references is prepared by the Radio Laboratory of the Bureau of Standards and is intended to cover the more important papers of interest which have recently appeared in technical periodicals.

For about two years these lists have been prepared in mimeographed form, and a very limited number of copies have been available for distribution. Recently there has arisen a very considerably increased demand, and it has seemed desirable to publish the lists in the Radio Service Bulletin. The publication of these references will be continued if the readers of the Radio Service Bulletin find them useful. The Bureau of Navigation will be pleased to receive suggestions from readers as to the desirability of continuing their publication. A complete file of the previous mimeographed lists can be consulted at the Bureau of Standards in Washington. Files of earlier lists can also be consulted at the Library of Congress in Washington, the Engineering Societies Library in New York, and the John Crerar Library in Chicago.

These references are classified according to a decimal system outlined in a report prepared at the Radio Laboratory of the Bureau of Standards, An Extension of the Dewey Decimal Classification Applied to Radio. It is expected that this classification will be published later. In this list the subjects corresponding to the 10 principal classes of the radio classification are given, and preceding each reference is given a number which corresponds to the classification of the reference. The subjects corresponding to the various decimal divisions of the 10 principal classes are not given in these lists, but can be found in the classification. In case a reference could properly be assigned to two or more of the numbers of the classification, it appears only once in this list, with the number corresponding to the subject in connection with which the reference is of greatest importance. In this list, under the first eight principal classes, the numbers assigned to the references are preceded by the letter "R," which is an abbreviation for the number 621.384 which is assigned to radio communication in the regular Dewey Decimal Classification. Under the class "R 800—Nonradio Subjects," the numbers shown in this list are not preceded by an "R," but are the numbers assigned to the subject of the reference in the regular complete Dewey Classification.

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The A. R. R. L. operating department will conduct the third series of trans-Atlantic tests with the cooperation of the English, French, and Dutch amateurs in December this year. While no definite dates for the final tests have been decided upon, pending suggestions from England, France, and Holland, the probable dates are December 12 to 31, inclusive.

During the first 10 days of the tests American and Canadian amateurs will transmit signals for reception in England, France, and Holland. The best American transmitters, as determined by reception reports from the European amateurs, will be selected to broadcast the result of the reception of signals transmitted by English and French amateurs during the last 10 days of the tests, the same as MUU and WII did last year.

Transmitting will be from 7 p. m. of one day to 1 a. m. the following day, during the first 10 days; "listening in" will be from 8 p. m. of one day to 2 a. m. the following day in the second 10-day period. That is the tentative plan for the final tests.

For the purpose of determining the transmitters that are to be allotted individual transmitting periods, preliminary tests will be held from October 25 to November 3, inclusive.

Instead of requiring each transmitter desiring to participate in the finals to file an entry blank for preliminary tests as was done last year, a scheme has been adopted that will give every transmitter a chance to participate in the preliminary tests by dividing 24 hours (9.30 p. m. to midnight) into 10 periods of 15 minutes each, during each of which 15-minute periods every test night every transmitter in each inspection district is entitled to transmit. All other districts are to copy signals from stations transmitting.

To qualify for an individual schedule and code letters during the final tests, a transmitter must show documentary evidence that its signals have been copied at a distance of at least 1,200 air-line miles during the preliminary tests. This evidence may be in the form of a post card received from a receiving station located at least 1,200 air-line miles from the transmitter.

It may happen that one of the best transmitters may be out of commission during the preliminary tests so that it would be quite impossible to produce a record card. In this event an operator may file application for entry in the final tests by sending in at least two records showing the signals from his transmitter have been copied at a distance of at least 1,200 air-line miles during the months of September or October.

The schedule for the preliminary tests is given in Central Standard time, which is one hour behind Eastern time, one hour ahead of Mountain time, and two hours ahead of Pacific time.

Here is what to do during the preliminary tests:

Transmit your own call letters according to the preliminary test schedule for exactly 15 minutes. Start promptly and do not overlap. If you are located in the fifth district you will transmit from 10.45 p. m. to 11 p. m. on October 25; from 10.30 to 10.45 p. m. on October 26; and so on through the 10 nights. Carry on your regular league traffic until 9.30 p. m., then QRX for the tests. Do not transmit tests at any other time than that shown on the schedule.

While one entire district is transmitting, all stations in the other districts are to copy as many stations as possible. After the tests each night, each receiving station should send a confirming record to every station that was heard at a distance of 1,200 air-line miles or over. Operators will need all the receiving practice they can get before the final tests, as signals are expected to be copied from England and French amateur transmitters.

Any station which can show at least one record of 1,200 air-line miles or better during the preliminary tests or as mentioned previously, and desires to enter in the final tests, shall furnish the following information when making application for entry:

Complete name and address of owner and station, call letters, type of transmitter (spark, c. w., i. c. w., a. c. c. w.), wave-length, complete description of antenna with ground or counterpoise, power input, and antenna current.

Trans-Atlantic preliminary test schedule by inspection districts.

Hour.	Oct. 25.	Oct. 26.	Oct. 27.	Oct. 28.	Oct. 29.	Oct. 30.	Oct. 31.	Nov. 1.	Nov. 2.	Nov. 3.
9.30- 9.45 p. m.....	(C)	1	2	3	4	5	6	7	8	9
9.45-10.00 p. m.....	1	2	3	4	5	6	7	8	9	(C)
10.00-10.15 p. m.....	2	3	4	5	6	7	8	9	(C)	1
10.15-10.30 p. m.....	3	4	5	6	7	8	9	(C)	1	2
10.30-10.45 p. m.....	4	5	6	7	8	9	(C)	1	2	3
10.45-11.00 p. m.....	5	6	7	8	9	(C)	1	2	3	4
11.00-11.15 p. m.....	6	7	8	9	(C)	1	2	3	4	5
11.15-11.30 p. m.....	7	8	9	(C)	1	2	3	4	5	6
11.30-11.45 p. m.....	8	9	(C)	1	2	3	4	5	6	7
11.45-12.00 p. m.....	9	(C)	1	2	3	4	5	6	7	8

"C" represents Canadian amateurs. Time given is central standard.

CHANGE IN WAVE LENGTH OF MARION (WCC).

Since the first of the current month the Marion coast station call signal, WCC, has been maintaining a constant watch on 2,100 meters for continuous wave equipped ships running to the southward of Cape Cod. This service is in addition to the watches heretofore maintained, which have been more or less directionally to the eastward.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, November 1, 1922—No. 67

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name	= Name of station.
Loc.	= Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call	= Call letters assigned.
System	= Radio system used and sparks per second.
Range	= Normal range in nautical miles.
W. l.	= Wave lengths assigned: Normal wave lengths in italics.
Service	= Nature of service maintained:
	PG=General public.
	PR=Limited public.
	RC=Radio compass station.
	P=Private.
	O=Government business exclusively.
Hours	= Hours of operation.
	N=Continuous service.
	X=No regular hours.
	m=a. m. (12 m=midday).
	s=p. m. (12 s=midnight).
Rates	= Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co.	= Independent Wireless Telegraph Co.
R. C. A.	= Radio Corporation of America.
S. O. R. S.	= Ship Owners' Radio Service.
C. w.	= Continuous wave.
I. c. w.	= Interrupted continuous wave.
V. t.	= Vacuum tube.
FX.	= Fixed station.

CERTIFICATE: By direction of the Secretary of Commerce this publication is issued as an administrative report and is required for the proper transmission of the public business.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Camp 62, Calif. ¹	KVP	527, 1,650.....	P	X	Southern California Edison Co.
Camp 63, Calif. ²	KRY	527, 1,650.....	P	X	Do.
Jackson, Ohio ³	WJQ	465.....	P	X	Ford Motor Co.

¹ Loc. (approximately) 0.119° 02' 00", N. 37° 19' 00"; range, 75; system, De Forest v. t. telephone and telegraph; rates, none.

² Loc. (approximately) 0.118° 58' 00", N. 37° 16' 00"; range, 75; system, De Forest v. t. telephone and telegraph; rates, none.

³ Loc. (approximately) 0.81° 05' 00", N. 39° 10' 00"; range, 100; system, composite, v. t. telephone and telegraph; rates, none.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates	Service.	Hours.	Owner of vessel.	Station controlled by—
City of Saugatuck ¹	KFET	.....	PG	X	Graham & Morton Transportation Line.	R. C. A.
City of Holland ¹	KFES	.....	PG	X	do.....	Do.
Frank H. Goodyear ²	KFEG	.....	PG	X	American S. S. Co.	Owner of vessel.
James MacNaughton.....	KFCN	.....	PG	X	Wilson Transit Co.	Do.
Merida ³	KFEN	8	PG	X	Atlantic & Caribbean Steam Navigation Co.	Do.
Steelore.....	KFCG	8	PG	X	Guaranty Trust Co. of New York (trustee)	R. C. A.
Steel traveler.....	KFCI	8	PG	X	U. S. Steel Products Co.	Do.
Stuyvesant.....	WJP	.....	.....	.....	Panaman Government	Owner of vessel.
Velero II ⁴	WHV	.....	PG	X	G. Allan Hancock.....	Do.
William C. Agnew ²	KFCT	.....	PG	X	American S. S. Co.	Do.

¹ Range, 150; system, R. C. A., 1000; w. l., 300, 600; rates, Great Lakes service 2¢ per word.

² Range, 150; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, 600; rates, Great Lakes service 2¢ per word.

³ Range, 150; system, Navy-R. C. A., 1000; w. l., 300, 600.

⁴ Range, 300; system, composite, 1000; w. l., 300, 600, 1800; rates, North and South American service 4¢ per word; transoceanic service 8¢ per word.

Commercial land and ship stations alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KFCG	Steelore.....b	KFET	City of Saugatuck.....b
KFCI	Steel Traveler.....b	KVP	Camp 62, Calif.....c
KFCN	James MacNaughton.....b	KRY	Camp 63, Calif.....c
KFCT	William C. Agnew.....b	WJQ	Jackson, Ohio.....c
KFEG	Frank H. Goodyear.....b	WHV	Velero II.....b
KFEN	Merida.....b	WJP	Stuyvesant.....b
KFES	City of Holland.....b		

* *Broadcasting stations, alphabetically by names of cities.*

[Additions to the List of Radio Stations of the United States, edition June 30, 1922.]

City.	Call signal.	City.	Call signal.
Ann Arbor, Mich.....	WMAX	Lima, Ohio.....	WOAC
Atlanta, Ga.....	WGM	Lincoln, Nebr.....	WSAS
Auburn, Ala.....	WMAV	Macon, Ga.....	WMAZ
Austin, Tex.....	WNAS	Manhattan, Kans.....	WNAK
Baker, Oreg.....	KFDA	Parkesburg, Pa.....	WQAA
Belvidere, Ill.....	WOAG	Pendleton, Oreg.....	KFFE
Billings, Mont.....	KFCH	Philadelphia, Pa.....	WNAT
Boise, Idaho.....	KFDD	Portland, Oreg.....	KFEC
Butler, Mo.....	WNAR	Shreveport, La.....	WMAU
Chicago, Ill.....	WNAJ	Sigourney, Iowa.....	WOAD
College Station, Tex.....	WTAW	Springfield, Ohio.....	WNAP
Colorado Springs, Colo.....	KFBV	State College, Pa.....	WPAB
Council Bluffs, Iowa.....	WPAF	St. Louis, Mo.....	WMAY
David City, Nebr.....	WRAR	Syracuse, N. Y.....	WNAN
Erie, Pa.....	WOAV	Taft, Calif.....	KFEB
Evansville, Ind.....	WNAM	Waco, Tex.....	WWAC
Grand Forks, N. Dak.....	WOAB	Wahoo, Nebr.....	WPAA
Houston, Tex.....	WSAV	Wahpeton, N. Dak.....	WMAW
Laredo, Tex.....	WWAX	Walla Walla, Wash.....	KFCF

Lists of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 and 400 meters), alphabetically by call letters.

[Additions to the List of Radio Stations of the United States, edition June 30, 1922.]

Call signal.	Station operated and controlled by—	Location of station.	Wave lengths.
KFBV	Clarence O. Ford.....	Colorado Springs, Colo., 523 South Hancock Street.	360
KFCF	Frank A. Moore.....	Walla Walla, Wash., 707 Baker Building.	360
KFCH	Electric Service Station (Inc.).....	Billings, Mont., 12 North Thirtieth Street.	360
KFDA	Adler's Music Store.....	Baker, Oreg.....	360
KFDD	St. Michaels Cathedral.....	Boise, Idaho.....	360
KFEB	City of Taft.....	Taft, Calif.....	360
KFEC	Meier & Frank Co.....	Portland, Oreg.....	360
KFFE	Eastern Oregon Radio Co.....	Pendleton, Oreg., Penland Building.	360
WGM	Atlanta Constitution.....	Atlanta, Ga.....	400
WMAU	Louisiana State Fair Association (W. E. Antony).	Shreveport, La.....	360
WMAV	Alabama Polytechnic Institute.....	Auburn, Ala.....	360, 485
WMAW	Wahpeton Electric Co.....	Wahpeton, N. Dak.....	360
WMAX	K. & K. Radio Supply Co.....	Ann Arbor, Mich.....	360
WMAY	Kingshighway Presbyterian Church.....	St. Louis, Mo.....	360
WMAZ	Mercer University.....	Macon, Ga.....	360
WNAJ	Benson Co.....	Chicago, Ill.....	360
WNAK	Manhattan Radio Supply Co.....	Manhattan, Kans.....	360
WNAM	Ideal Apparatus Co.....	Evansville, Ind.....	360
WNAN	Syracuse Radio Telephone Co.....	Syracuse, N. Y.....	360
WNAP	Wittenberg College.....	Springfield, Ohio.....	360
WNAR	C. C. Rhodes.....	Butler, Mo.....	360
WNAS	Texas Radio Corporation and Austin Statesman.	Austin, Tex.....	360
WNAT	Lenning Brothers Co.....	Philadelphia, Pa.....	360
WOAB	Valley Radio.....	Grand Forks, N. Dak.....	360
WOAC	Maus Radio Co.....	Lima, Ohio.....	360
WOAD	Friday Battery & Electric Corp.....	Sigourney, Iowa.....	360
WOAG	Apollo Theatre (Belvidere Amusement Co.)	Belvidere, Ill.....	360
WOAV	Pennsylvania National Guard, 2nd Bat., 112th Inf.	Erie, Pa.....	360
WPAA	Anderson & Webster Electric Co.....	Wahoo, Nebr.....	360
WPAB	Pennsylvania State College.....	State College, Pa.....	360
WPAF	Peterson Radio Co.....	Council Bluffs, Iowa.....	360
WQAA	Horace A. Beale, Jr.....	Parkesburg, Pa.....	360
WRAR	Jacob C. Thomas.....	David City, Nebr.....	360
WSAS	State of Nebraska, Department of Agriculture.	Lincoln, Nebr.....	360, 485
WSA	Clifford W. Vick Radio Construction Co.....	Houston, Tex., 1801 Carter Building.	360
WTAW	Agricultural and Mechanical College.....	College Station, Tex.....	360
WWAC	Sanger Bros.....	Waco, Tex.....	360
WWAX	Wormser Bros.....	Laredo, Tex.....	360

Government land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Columbus, Ohio.....	WVZ		O	N	U. S. Army, (Fifth Corps Area, Columbus Barracks).
Manasquan, N. J. ¹	NAH	800	RC	N	U. S. Navy.

¹ Loc. 0.74° 01' 58", N. 40° 07' 05"; range, 150; system, U. S. Navy.

Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Army Tanker No. 1 ¹	WXN	U. S. Army.

¹ Range, 200; system, Kilbourne & Clark, 1000; w. l., 600, 800, 975; service O, hours, N.

Government land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NAH	Manasquan, N. J. (RC).....c	WXN	Army Tanker No. 1..... b
WVZ	Columbus, Ohio.....c		

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922.]

Station.	Call signal.	Wave lengths.	Station controlled by—
Appleton, Wis.....	9YAR	200, 375.....	Lawrence College. Department of Physics.
Berkeley, Calif.....	6XAY	200, 375, variable.	C. B. Tinsley, 3017 Wheeler Street.
Binghamton, N. Y.....	8XAM	200, variable.....	Arthur L. Kent, 199 Court Street.
Buffalo, N. Y.....	8YP	200, 375.....	Seneca Vocational School.
Butte, Mont.....	7XMX	Variable.....	Great Falls Power Co.
Butte, Mont.....	7ZF	200, 375.....	F. F. Gray, 3200 Richardson Street.
Cleveland, Ohio.....	8YL	200, 375.....	East End Y. M. C. A.
Dallas, Tex.....	5XADA	200, 375.....	John O. Newbury, 1822 Bennett Avenue.
Dublin, Tex.....	5XAJ	200, 375.....	C. B. Baxter, 204 Grafton Street.
El Monte, Calif.....	6XAX	Variable.....	G. S. Corpe, 517 West Main Street.
Enid, Okla.....	5XAEA	200, 375.....	Radio Phone Sales Co.
Enumclaw, Wash.....	7YQ	200, 375.....	Enumclaw High School.
Honolulu, Hawaii.....	6ZY	200, 375.....	Thomas A. Marshall, 242-D Katulani Avenue.
Los Angeles, Calif.....	6XAH	Variable.....	Archie Wade, jr., 465 North Lake Street.
Los Angeles, Calif.....	6XW	Variable.....	Hall Berringer, 637 South Hope Street.
Macon, Ga.....	4XL	Variable.....	Mercer University.
Mansfield, Ohio.....	8ZU	200, 375.....	Radio Club of Mansfield, 1394 Carpenter Road.
Newark, N. J.....	2XAR	Variable.....	D. W. M. y (Inc.), 325 Central Avenue.
Quincy, Ill.....	9XQ	200, 375.....	Quincy Electric Supply Co., 10 Maine Street.
Rainbow, Mont. (near Great Falls).....	7XO	Variable.....	Great Falls Power Co.
Redlands, Calif.....	6YC	200, 375.....	University of Redlands.
Reedley, Calif.....	6XAV	Variable.....	W. W. Lindsay, jr., P. O. Box 643.
San Diego, Calif. (portable).....	6XN	Variable.....	Dr. Alfred E. Banks, Timken Building.
San Diego, Calif.....	6XZ	200, variable.....	R. O. Shelton, M. D.
San Ysidro, Calif.....	6ZH	200, 375.....	Lester Pickler.
St. Louis, Mo.....	9XR	Variable.....	Colin B. Kennedy Co., 6400 Plymouth Avenue.
Tarrytown, N. Y.....	2XL	Variable.....	Tarrytown Radio Research Laboratory.
Thompson Falls, Mont.....	7XN	Variable.....	Thompson Falls Power Co.
Valley Stream, N. Y.....	2XAQ	Variable.....	J. O. Smith, 3 Corona Avenue.
White Sulphur Springs, W. Va.....	8XP	Variable.....	General Electric Co., Schenectady, N. Y.
Winter Park, Fla.....	4XK	225, 275.....	Winter Park Electrical Construction Co.

Special land stations, grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
2X AQ	Second district:	6ZH	Sixth district—Con.
2X AR	Valley Stream, N. Y.	6ZY	San Ysidro, Calif.
2X L	Newark, N. J.		Honolulu, Hawaii.
4X K	Tarrytown, N. Y.	7X M	Seventh district:
4X L	Fourth district:	7X N	Butte, Mont.
	Winter Park, Fla.	7X O	Thompson Falls, Mont.
	Macon, Ga.	7Y Q	Rainbow, Mont. (near Great Falls).
5X ADA	Fifth district:	7Z F	Humble, Wash.
5X AEA	Dallas, Tex.		Butte, Mont.
5X AJ	Enid, Okla.	8X AM	Eighth district:
	Dublin, Tex.	8X P	Birmingham, N. Y.
6X AH	Sixth district:	8Y L	White Sulphur Springs, W. Va.
6X AV	Los Angeles, Calif.	8Y P	Cleveland, Ohio.
6X AX	Reedley, Calif.	8Z U	Buffalo, N. Y.
6X AY	El Monte, Calif.		Mansfield, Ohio.
6X N	Berkeley, Calif.	9X Q	Ninth district:
6X W	San Diego, Calif. (portable).	9X R	Quincy, Ill.
6X Z	Los Angeles, Calif.	9Y AR	St. Louis, Mo.
6Y C	San Diego, Calif.		Appleton, Wis.
	Redlands, Calif.		

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States; edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berné bureau.]

DAYTOWN, TEX.—W. l., 300, 450, 600.

CAPE EDWARDS, ALASKA.—Strike out all particulars.

CLEVELAND, OHIO. (KDPM).—W. l., 300, 500, 600, 1610.

DETROIT, MICH.—W. l., 300, 600, 1625.

EAST PITTSBURGH, PA.—W. l., 1875.

EVERETT, WASH. (KFT).—Accounts for message charges should be forwarded to S. O. R. S.

FERRIS OIL FIELD, WYO.—Strike out all particulars.

HYDER, ALASKA.—Range, 300; w. l., 300, 600, 1610; hours, 9 a. m.—12 noon and 6–9 p. m.

LOCKANOK, ALASKA.—Range, 300.

LOST HARBOR, ALASKA.—W. l., 300, 550, 600.

MILES CITY, MONT.—Range, 200.

NIXON FORK, ALASKA.—Strike out all particulars.

NORFOLK, VA.—Strike out all particulars.

PIRATE COVE, ALASKA.—Service, PG and PR.

PORT TOWNSEND, WASH.—Strike out all particulars.

QUINCY, MASS.—System, General Electric Co., v. t. telephone, and telegraph.

RAWLINS, WYO.—Strike out all particulars.

SALTCHUCK, ALASKA.—W. l., 300, 550, 600.

SPRINGWELLS, MICH.—Strike out all particulars.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berné bureau.]

NOTE.—(U. S. L.) after operating company denotes that the change applies to the List of Radio Stations of the United States only; does not apply to the Berné list. Hereafter where the rate is given without the service specifically stated—that is, North and South American and transoceanic services—it should be understood that the rate is for both classes of service. When the rate is for one class of service only, the class of service will be stated.

ANTILLA.—W. l., 300, 600.

ARGON.—W. l., 300, 450, 600.

ASUNCION.—W. l., 300, 600; system, R. C. A., 240.

ATENAS.—System, composite, 1000.

BASCOBEL.—Station operated and controlled by R. C. A. (U. S. L.).

BASFORD.—System, Navy-Simon, 1000; w. l., 300, 450, 600.

BELLA.—Strike out all particulars.

BLUE HILL.—Range, 150; system, R. C. A., 1000; w. l., 300, 450, 600.

CAMAGUEY.—Hours, X.

- CAPULIN.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000.
w. l., 300, 450, 600.
- CASIANA.—Range, 300.
- CATHLAMET.—Range, 300; system, Navy-Kilbourne & Clark, 1000.
- CEDARHURST.—American-Italian S. S. Co. owner of vessel.
- CITY OF HONOLULU.—Strike out all particulars.
- CITY OF RENO.—Station operated and controlled by I. W. T. Co.
- CLARE.—System, I. W. T. Co., 1000; w. l., 300, 450, 600.
- COMANCHE.—System, I. W. T. Co., 1000; w. l., 300, 450, 600.
- COSTILLA.—Name changed to Charles L. O'Connor.
- COURTOIS.—Munson S. S. Line owner of vessel.
- COUSHATTA.—Name changed to John Tracy.
- COVERUN.—Name changed to Mahukona; Matson Navigation Co. owner of vessel.
- CRANFORD.—W. l., 300, 450, 600.
- CRUDOIL.—Huasteca Petroleum Co. owner of vessel.
- DELCO.—American Sugar Transit Corp. owner of vessel.
- DEPERE.—Range, 200.
- EASTERN SAILOR.—Range, 200; system, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
- ECLIPSE.—System, Navy-Wireless Specialty Apparatus Co., 1000.
- ELABETO.—System, Navy-International Radio Telegraph Co., 1000.
- ELDENA.—Station operated and controlled by R. C. A. (U. S. L.).
- ELECHRO.—System, Navy-Marconi, 1000.
- EL VALLE.—W. l., 300, 600.
- EVERGREEN CITY.—Range, 300; system, Navy-R. C. A., 1000; w. l., 300, 600.
- FORT SEWARD.—Strike out all particulars.
- FUEL OIL.—Mexican Petroleum Corp. owner of vessel.
- GUANTANAMO.—Hours, X.
- JALAPA.—Range, 500; system, Federal arc; w. l., 300, 600, 1800.
- JOHN R. GIBBONS.—W. l., 300, 450, 600.
- LAKEBRIDGE.—Station operated and controlled by R. C. A.
- LAKE FLOUENOY.—Name changed to Southseas.
- LAKE SLAVI.—Lyke Bros. S. S. Co. owner of vessel.
- LAKE SUNAPEE.—Name changed to Frank Lynch; W. J. Gray, jr., owner of vessel.
- LANCASTER.—Lancaster S. S. Corp. owner of vessel.
- LAVADA.—Station operated and controlled by S. O. R. S. (U. S. L.).
- LIBERATOR (KRIU).—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600; hours, X.
- LINCOLN LAND.—Joseph F. Fertilla owner of vessel.
- LUXALILE.—W. l., 300, 450, 600.
- MEDON.—Range, 300; system, Federal arc; w. l., 300, 600, 1800.
- MEXOIL.—Huasteca Petroleum Co. owner of vessel.
- MISSOURIAN.—Range, 300; system, Telefunken, 1000; W. l., 300, 600.
- MOUNT CARROLL.—W. l., 300, 450, 600, 1800.
- MUNWOOD.—System, R. C. A., 1000; w. l., 300, 450, 600.
- MYSTIC.—System, Navy-Marconi, 1000; w. l., 300, 450, 600; rates, 8 c. per word.
- NARBO.—Station operated and controlled by S. O. R. S. (U. S. L.).
- NEPONSET.—Station operated and controlled by R. C. A. (U. S. L.).
- NIKA.—Everett Packing Co. owner of vessel.
- NORMA.—System, Navy-Marconi, 1000; Norma S. S. Corp. owner of vessel.
- OREGONIAN.—W. l., 300, 450, 600; rates, 8 c. per word.
- PANOIL.—Mexican Petroleum Corp. owner of vessel.
- PANUCO.—Range, 300.
- PHILADELPHIA (KSM).—System, Navy-R. C. A., 1000; w. l., 300, 450, 600; rates, 8 c. per word.
- PRESIDENT HARRISON.—Station, operated and controlled by I. W. T. Co. (U. S. L.).
- PRESIDENT MONROE.—System, Navy-R. C. A., 1000.
- RIO GRANDE.—Strike out all particulars.
- ROTARIAN.—Range, 300; system, Navy-R. C. A., 1000; w. l., 300, 450, 600.
- SABINE.—Strike out all particulars.
- SACCARAPPA.—W. l., 300, 450, 600.
- SAN DIEGO.—Hart-Wood Lumber Co. owner of vessel.
- SANTA TERESA.—W. l., 300, 450, 600.
- SHERMAN.—Range, 150.
- SIERRA.—Service, P. G.
- SOCONY 84.—Standard Transportation Co. owner of vessel.
- SOCONY 89.—Standard Transportation Co. owner of vessel.

STEEL MARINER.—Range, 300; system, R. C. A., 1000; w. l., 300, 600; hours, X.
 SUDBURY.—System, Cutting & Washington, 1000.
 SUHOLCO.—Rates, 8 c. per word.
 SWIFT SCOUT.—W. l., 300, 600.
 TIPTON.—Name changed to Esther Weems.
 VABA.—American-Italian S. S. Co., owner of vessel.
 VELERO.—Strike out all particulars.
 WESTERN GLEN.—System, Navy-Lownestein, 1000; w. l., 300, 450, 600; hours, X.
 WESTERN PLAINS.—System, Navy-R. C. A., 1000; hours, X.
 WESTERN WORLD.—Range, 200; system, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600, 1800.
 WEST HEMATITE.—Station operated and controlled by I. W. T. Co. (U. S. L.).
 WEST MODUS.—System, Navy-Lownestein, 1000; w. l., 300, 450, 600.
 WILLIAM ISOM.—Curtis Bay Copper & Iron Works owner of vessel.
 WOLVERINE STATE.—Name changed to President Harrison.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDMQ, *read* President Harrison; KENM, *read* Mahukona; KLIU, *read* Frank Lynch; KUGF, *read* Southeast; WMEA, *read* Charles L. O'Connor; WQOA, *read* Esther Weems; WVOO, *read* John Tracy; strike out all particulars following the call signals. KDIR, KDIC, KDRY, KEB, KEG, KEVJ, KEY, KRF, KUSD, WAX, WHV, WPT, WPZ.

BROADCASTING STATIONS, BY CALL SIGNALS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922.]

KFAY (Central Point, Oreg.).—*Read* Medford, Oreg.; w. l., add 485.
 KFBB (Butte, Mont.).—Strike out all particulars.
 KFBS (Trinidad, Colo.).—Station operated and controlled by Trinidad Gas & Electric Co. and the Chronicle News.
 KJR (Seattle, Wash.).—Station operated and controlled by Northwest Radio Service Co., (Vincent I. Kraft).
 KMC (Reedley, Calif.).—Station operated and controlled by W. W. Lindsay, jr., 1516 F. Street.
 KOE (Spokane, Wash.).—Strike out all particulars.
 KQT (Yakima, Wash.).—Strike out all particulars.
 KVV (Sacramento, Calif.).—Station operated and controlled by Sacramento Bee (James McClatchy Co.).
 KYG (Portland, Oreg.).—Strike out all particulars.
 WAAL (Minneapolis, Minn.).—Station operated and controlled by Beamish Electric Co. only.
 WBAP (Fort Worth, Tex.).—W. l., 400, 485.
 WBAM (New Orleans, La.).—Strike out all particulars.
 WBAZ (Richmond, Va.).—Strike out all particulars.
 WCAN (Jacksonville, Fla.).—Strike out all particulars.
 WCAW (Quincy, Ill.).—Station operated and controlled by Quincy Electric Supply Co. only.
 WCK (St. Louis, Mo.).—W. l., 360 only.
 WDAB (Portsmouth, Ohio).—Strike out all particulars.
 WDAD (Lindsborg, Kans.).—Strike out all particulars.
 WDAF (Kansas City, Mo.).—W. l., 400, 485.
 WDAT (Worcester, Mass.).—Strike out all particulars.
 WFAT (Sioux Falls, S. Dak.).—W. l., 360, 485.
 WFI (Philadelphia, Pa.).—W. l., 400, 485.
 WGAV (Savannah, Ga.).—Strike out all particulars.
 WHAD (Milwaukee, Wis.).—W. l., 360, 485.
 WHAJ (Bluefield, W. Va.).—Strike out all particulars.
 WHAL (Lansing, Mich.).—Station operated and controlled by Jefferys & Derby Drug Co.
 WHAM (Rochester, N. Y.).—W. l., 360, 485.
 WHAU (Corinth, Miss.).—Strike out all particulars.
 WHAX (Holyoke, Mass.).—Strike out all particulars.
 WHB (Kansas City, Mo.).—W. l., 400, 485.

WHQ (Rochester, N. Y.).—Strike out all particulars.
 WHU (Toledo, Ohio).—Strike out all particulars.
 WIAC (Galveston, Tex.).—W. 1., 360, 485.
 WIAL (Norwood, Ohio).—Strike out all particulars.
 WIAP (Springfield, Mass.).—Strike out all particulars.
 WJAE (San Antonio, Tex.).—W. 1., add 485.
 WJAG (Norfolk, Nebr.).—W. 1., add 485.
 WJAK (Stockdale, Ohio). W. 1., add 485.
 WJT (Erie, Pa.).—Strike out all particulars.
 WJZ (Newark, N. J.).—W. 1., strike out 485.
 WKAA (Cedar Rapids, Iowa).—W. 1., add 485; station operated and controlled by H. F. Paar.
 WLAB (Carrollton, Mo.).—Strike out all particulars.
 WLAQ (Kalamazoo, Mich.).—Address 108 Elm Street.
 WOC (Davenport, Iowa).—W. 1., 400, 485.
 WPL (Zanesville, Ohio).—Strike out all particulars.
 WSB (Atlanta, Ga.).—W. 1., 400, 485.
 WMT (Buffalo, N. Y.).—Strike out all particulars.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

BETHEL, ALASKA.—Loc. (approximately) $0.161^{\circ} 45' 00''$, N. $60^{\circ} 48' 00''$; system, U. S. Army, v. t. telephone, and telegraph; w. 1., 430, 480, 530, 600; service, PG; hours, 9 a. m.—7 p. m.; rates, ship service, 6 c. per word.
 CHICAGO, ILL. (KDQA).—Call signal changed to WWG.
 CIRCLE, ALASKA.—Loc. (approximately) $0.144^{\circ} 04' 18''$, N. $65^{\circ} 49' 12''$; range, 500; service, PG (FX); hours, 7:30 a. m.—5 p. m.
 CRAIG, ALASKA.—Range, 200; hours, 9 a. m.—7 p. m.; rates, ship service, 6 c. per word.
 FAIRBANKS, ALASKA.—Range, 500; system, U. S. Army arc; w. 1., 1000, 1400, 2000, 3800, 4200, 5000; service, PG (FX).
 FORT EGBERT, ALASKA.—Loc. $0.141^{\circ} 13' 48''$, N. $64^{\circ} 46' 19''$; system, U. S. Army v. t. telephone, and telegraph; w. 1., 600; service, PG (FX); hours, 8 a. m.—5 p. m.
 FORT GIBBON, ALASKA.—Loc. $0.152^{\circ} 05' 21''$, N. $65^{\circ} 10' 16''$; range, 1000; service, U. S. Army, 1000; service, PG (FX); hours, 8 a. m.—5 p. m.
 FORT ST. MICHAEL, ALASKA.—System, U. S. Army, v. t. telephone, and telegraph; w. 1., 450, 485, 550, 600; hours, 8:30 a. m.—7:15 p. m.; rates, ship service, 6 c. per word.
 FORT YUKON, ALASKA.—Range, 200; service, PG (FX); hours, 7:30 a. m.—5 p. m.
 GREAT LAKES, ILL.—W. 1., 4900 meters changed to 4650 meters.
 HOLY CROSS, ALASKA.—System, U. S. Army, v. t. telephone, and telegraph; service, PG (FX); hours, 9 a. m.—7 p. m.
 IDITAROD, ALASKA.—System, U. S. Army, v. t. telephone, and telegraph; w. 1., 425, 580, 600, 650; service, PG (FX); hours, 9 a. m.—8 p. m.
 KOTLIK, ALASKA.—Strike out all particulars.
 LIVNGOOD, ALASKA.—System, U. S. Army, 1000; w. 1., 600; service, PG (FX); hours, 8 a. m.—5 p. m.
 MANTOLOKING, N. J. (NAH).—Strike out all particulars.
 McGRATH, ALASKA.—Loc. $0.155^{\circ} 35' 00''$, N. $62^{\circ} 55' 00''$; system, U. S. Army, v. t. telephone, and telegraph; w. 1., 450, 500, 550, 600; hours, 8 a. m.—6 p. m.
 NEW ORLEANS, LA. (NAT).—W. 1., 4650 meters changed to 6800 meters.
 NOME, ALASKA.—Loc. $0.165^{\circ} 23' 33''$, N. $64^{\circ} 30' 20''$; system, U. S. Army, arc and v. t. telephone, and telegraph; w. 1., 480, 540, 600, 1400, 1950, 2600, 3300, 4300, 6000; rates, ship service, 6 c. per word.
 NOORVIK, ALASKA.—Loc. (approximately) $0.160^{\circ} 40' 00''$, N. $66^{\circ} 40' 00''$; system, U. S. Army, v. t. telephone, and telegraph; range, 600; service, PG; hours, 8 a. m.—7:30 p. m.; rates, ship service, 6 c. per word.
 NULATO, ALASKA.—System, U. S. Army, v. t. telephone, and telegraph; w. 1., 520, 600, 730, 1950; service, PG (FX); hours, 8 a. m.—9 p. m.
 ST. PETERSBURG, FLA.—Strike out all particulars.
 WRANGELL, ALASKA.—System, U. S. Army, v. t. telephone, and telegraph; w. 1., 425, 600, 850; hours, 10 a. m.; 2, 4, and 6:30 p. m., listening in 15 minutes each schedule for ships; rates, ship service, 6 c. per word.

NOTE.—All radio stations of the Lighthouse Service are now operated and controlled by that service.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals, NAH (Mantoloking, N. J.); NGL and WVF; KDQA changed to WWG.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922.]

ALTADENA, CALIF. (6XR) (portable).—W. l., variable.
 ATHOL, MASS. (1XP).—W. l., variable.
 ATLANTA, GA. (4XC).—W. l., 200, 375, variable.
 AUSTIN, TEX. (5XX).—W. l., 200, 375.
 BIRMINGHAM, ALA. (5ZAS).—Address 1913 Fifth Avenue.
 BOZEMAN, MONT. (7ZD).—Strike out all particulars.
 BUENA VISTA, GA. (4XE).—Strike out all particulars.
 BUTTE, MONT. (7YP).—Strike out all particulars.
 CHICAGO, ILL. (9ZN).—Address 332 South Michigan Avenue.
 CINCINNATI, OHIO (8XAH).—W. l., 200, variable.
 CLEVELAND, OHIO (8XT).—Strike out all particulars.
 COLORADO SPRINGS, COLO. (9XC).—W. l., 200, variable.
 COLUMBUS, OHIO (8ZO).—Strike out all particulars.
 DAVENPORT, IOWA (9YAP).—Strike out all particulars.
 ELLENDALE, N. DAK. (9ZX).—Station operated and controlled by H. J. Goddard only.
 HAGERSTOWN, MD. (3ZI).—Strike out all particulars.
 HIGHLAND PARK, MICH. (8ZZ).—Address 137 Hill Avenue.
 MEMPHIS, TENN. (5XL).—Strike out all particulars.
 MONTCLAIR, N. J. (2XS).—Strike out all particulars.
 NEW BRAUNFELS, TEX. (5YK).—Address, Box 567.
 NEW YORK, N. Y. (2XU).—W. l., 420, variable.
 OAKLAND, CALIF. (6ZI).—Changed to Alameda, Calif.; station operated and controlled by R. S. Rheem and F. Ives Deetkin, 1535 Sixth Street.
 PHILADELPHIA, PA. (3ZJ).—Strike out all particulars.
 PITTSBURGH, PA. (8ZD).—Station operated and controlled by Parker E. Wiggin and F. B. Westervelt.
 PORTLAND, OREG. (7XG).—W. l., 200, 375, variable.
 PORTLAND, OREG. (7YK).—Station operated and controlled by Benson Tech Radio Club, Twelfth and Hoyt Streets.
 PRINCETON, N. J. (3XM).—W. l., 200, variable; station operated and controlled by Princeton University Radio Club.
 RICHMOND, IND. (9ZAE).—Strike out all particulars.
 RICHMOND, VA. (3ZP).—Station operated and controlled by Ralph R. Chappell and Wayne R. Deavers, 1815 Main Street.
 ROCHESTER, N. Y. (8ZK).—Strike out all particulars.
 SALEM, OHIO (8ZG).—Address 252 McKinley Avenue.
 SALT LAKE CITY, UTAH (6ZZ).—Station operated and controlled by H. C. Wilson (the Deseret News).
 SAN ANTONIO, TEX. (5ZAK).—Station operated and controlled by Headquarters, Battery, Second Field Artillery Brigade, Camp Travis, Tex.
 SAN FRANCISCO, CALIF. (6XO).—Station operated and controlled by Globe Radio Co.
 SCHENECTADY, N. Y. (2XA).—Address 212 Parkwood Boulevard.
 SOUTH PASADENA, CALIF. (6XAS).—W. l., 200, variable.
 ST. LOUIS, MO. (9ZV).—Address, 5047 Washington Street.
 TOLEDO, OHIO (8ZB).—Station operated and controlled by Earl S. Ensign only; address, 923 West Bancroft Street.
 WASHINGTON, D. C. (3XH).—Strike out all particulars.
 WASHINGTON, D. C. (3XZ).—W. l., 175, 200, 260.
 WATERBURY, CONN. (1XT).—W. l., variable.

MISCELLANEOUS.

FREE MEDICAL RADIO SERVICE FOR SHIPS AT SEA.

The United Fruit Co. announces the inauguration of a free medical radio service from its hospitals in the various countries of Central America and from its passenger ships to all ships at sea. So far as the United Fruit Co. and its subsidiary companies are concerned, this service is available without charge to ships of all nationalities through the following radio stations operated by the United Fruit Co. or the Tropical Radio Telegraph Co:

Radio stations and their call letters.

New Orleans, La. (WNU).	Puerto Castilla, Honduras (UA).
Burwood, La. (WBW).	Tezucigalpa, Honduras (UG).
Fort Morgan, Ala. (WIO).	Port Limon, Costa Rica (UX).
Swan Island, Caribbean Sea (US).	Almirante, Panama (UB).
Tela, Honduras (UC).	Santa Marta, Colombia (UJ).

All passenger steamships of the United Fruit Co.

For ships' call letters see International Radio Call Letter List or List of Radio Stations of the United States.

Radiograms requesting medical advice should be signed by the captain of the ship and should state briefly, but clearly, the symptoms of the person afflicted. Such radiograms should be addressed "Unifruitco" (name of place) and may be sent to any of the United Fruit Co.'s hospitals listed below:

Santa Marta, Colombia.	Tela, Honduras.
Port Limon, Costa Rica.	Puerto Castilla, Honduras.
Almirante, Panama.	Puerto Barrios, Guatemala.

All United Fruit Co. passenger steamships carry doctors, and free medical service may be procured by radio from any of them by a radiogram addressed "Ship's Doctor," followed by the name of the steamship. This free medical service is established, primarily, for the benefit of ships not carrying doctors. However, should occasion require, ships' doctors may hold consultation by radio with the United Fruit Co. ships' doctors and hospital staffs. The physicians and surgeons comprising the medical staff of the United Fruit Co. and its subsidiaries are thoroughly qualified, but in view of the fact that radio medical advice to ships at sea is given free and without an opportunity for a personal examination of the patients by them no responsibility will be assumed by either the company and its subsidiaries or the physicians or surgeons giving the advice as to its accuracy or for error in the receipt or transmission of any message sent or received in connection therewith. It is requested that when sending medical advice radiograms radio operators check them "(number of words) DH Medico." "DH Medico" radiograms will be given preference over all other radiograms, excepting SOS calls, throughout the radio service of the United Fruit Co. and subsidiary companies.

APPLICANT FOR RADIO OPERATOR LICENSE BARRED FROM EXAMINATION.

Recently an applicant for radio operator's license was barred from being examined for a period of six months on account of having used a false name in his examination papers. Anyone making false statements in applying for examination will be likewise treated.

LARGE FRENCH RADIO COMPANY FOUNDED FOR COMMUNICATION WITH ASIA.

The French Wireless Co., "La Compagnie Generale de Telegraphie Sans Fil," has founded a subsidiary radio company to operate under the name of "Radio-Orient," which will inaugurate radio communications with Syria, Lebanon, and most of the European countries.

USE OF RADIO ON FOREIGN SHIPS PROHIBITED BY SWEDEN.

The decree of May 31, 1921, prohibiting the operation of radio of foreign ships in Swedish territorial waters within 10 miles (nautical) of a coastal radio station is being strictly enforced. The only exception to this rule is in cases of great urgency, or

where the safety of the ship is concerned. Under the same decree foreign ships in Swedish harbors may not receive wireless messages without the permission of the telegraph directorate.

GENERAL CALL ASSIGNED FOR R. C. A. SHIPS.

The general call signal WWAA has been assigned for all vessels operated and controlled by the Radio Corp. of America. This general call signal will be used by R. C. A. ships or coast stations desiring to ascertain whether there is an R. C. A. ship within range, and any R. C. A. vessel hearing another ship or coast station calling WWAA should answer. This call signal also will be used in broadcasting general instructions to R. C. A. ships.

CHANGE IN LAND LINE RATES FOR R. C. A. STATIONS.

Effective October 10, 1922, traffic received from ships at sea via coastal stations at Siasconset, Mass. (WSC), Chatham, Mass. (WIM), and Marion, Mass. (WCC), destined to points within the States of Maine, Massachusetts, or Rhode Island will apply a land line forwarding rate of 1 cent per word less than the published tariffs. The new land-line rates follow:

	Maine.	Massachusetts.	Rhode Island.
	Cents.	Cents.	Cents.
Via Siasconset (WSC).....	4	3	3
Via Chatham (WIM).....	4	3	3
Via Marion (WCC).....	4	3	3

INFORMATION FROM THE BERNE INTERNATIONAL BUREAU.

Egypt.—Port Said radio coast station is closed.

Italy.—From September 18, current, the coast station of Stromboli (IDE) no longer replaces Messina radio (LCF). It corresponds with ships, 600-meter wave length, only in cases of distress. The working hours for Messina radio station (LCF) are as follows: 1 to 3.30, 4 to 9, 9.30 to 13, 14 to 15, 16 to 18, 20 to 21, 21.30 to 22.30, and 23.30 to 24 (mean Greenwich time). At times, when this station is occupied with military or State communications, the ships to the northward of the Straits of Messina will transmit their radiotelegrams to Palermo (ICP), Napoli (ICN), or Cape Sperone (ICR) radio stations. Ships to the south of the Straits will transmit to Vittoria (ICV) or Cotrone (IDH) radio stations.

Tempio (IDR) station is open for the following hours: 8 to 10, 12 to 14, 16 to 18, 20 to 22 (mean Greenwich time). However, for particular reasons, this service may be interrupted.

From September 10, current, the hours of service of Genova (ICB) radio station are as follows: (a) For 600-meter wave length—0 to 4, 4.20 to 6, 6.20 to 15, 15.20 to 16, and 16.20 to 24 (mean Greenwich time). (b) For 2,400-meter wave length—4 to 4.20, 6 to 6.20, 15 to 15.20, and 16 to 16.20 (mean Greenwich time). During this last hourly listening in upon 600 meters for distress calls is effected by radio station Spezia (LCS).

REPORTING DERELICTS AND VESSELS IN DISTRESS.

It frequently happens that masters of vessels when sighting derelicts or vessels in distress and in reporting them by radio fail to observe and report essential data as to the position and condition of the craft, necessary before a search is begun by a United States Coast Guard cutter. In consequence of this neglect it frequently becomes necessary for the searching cutter to send radiograms in an effort to obtain the necessary information. To be complete, information concerning a derelict should state: (a) The position by latitude and longitude confirmed by the approximate bearing and distance from a fixed point on land; (b) the general condition of the vessel; (c) whether bottom up or awash; (d) height of hull above water and any abnormal conditions as to buoyancy; (e) as to whether masts are standing, sails set, or otherwise; (f) force and direction of wind; (g) any observed current, its set and strength.

Similar descriptive information should also be furnished of vessels in distress. This information is necessary in order to determine roughly the direction and speed of drift of the derelict or vessel and also to give an idea of the appearance of the object sought.

DATE ON WHICH AN OBSTRUCTION IS SIGHTED.

The attention of shipmasters is invited to the fact that it is very desirable to know the date when ice and other obstructions reported by radio from ship to ship were sighted. Many reports of this kind come to the Hydrographic Office of the Navy Department bearing only the date of the radiogram and lacking the date when the obstruction was seen. Cooperation in supplying this additional fact will assist the work of this office and will be thankfully appreciated.

RADIO WEATHER BULLETINS.

Beginning the first day of this month, the weather bulletins containing the weather reports, forecasts, and storm warnings will be broadcast from the naval radio stations at Key West, Fla., and Point Isabel, Tex., by continuous wave (arc) instead of by spark, as at present, on the following schedules: Key West (NAR), 10 p. m. (seventy-fifth meridian time); wave length, 5,700 meters. Point Isabel (NAY), midnight, noon, and 7 p. m. (seventy-fifth meridian time); wave length, 5,000 meters.

CALIBRATED ARCS OF U. S. NAVAL RADIO COMPASS STATIONS.

Bearings are only reliable in the arcs of the circle for which stations have been calibrated.

Stations.	Arc of calibration.
Empire ¹	230-360 (true).
Fort Stevens ²	185-295 (true).
Ocean Park ²	205-345 (true).
Tatoosh ²	230- 90 (true), clockwise.
New Dungeness ³	255- 95 (true), clockwise.
Smith Island ³	0-360 (true), complete circle.
Cattle Point ³	130-275 (true), clockwise.
Soapstone Point ³	253- 50 (true), clockwise.
Cape Hinchinbrook ²	112-294 (true), clockwise.

NOTE.—All of the above sectors must be understood as being of the circle of which the compass coil is at the center and are observed from the listed position of the compass stations.

STATIONS IN ALASKA CLOSED FOR THE SEASON.

Lazy Bay (KEPS) closed October 7.
 Port Althorp (KLW) closed October 14.
 Port Beauclaire (KWO) closed October 22.
 Uyak (KHA) closed October 13.
 Yakutat (KKA) closed October 22.

ADMIRALTY NOTICE TO MARINERS.

North Sea and Baltic Entrance—Denmark, Jutland.
 Blaavand W/T station.—Information regarding ice signals.
 Position.—Lat. 55° 33' N., long. 8° 05' (approximately).
 Call signal.—OXB.

Wave length.—600 meters.

Details.—During the winter ice signals are broadcasted by Blaavand (W/T station) twice daily, namely, at 11.20 and 21.20 G. M. T. (civil). The message is sent en clair (in the English language) and contains a short report on ice conditions in the main Danish waterways, compiled from information received by the Meteorological Institute. The preliminary signals are as follows: —.—.— OXB OXB OXB, ice report. This is followed by the number of words comprising the message proper and then the text of the latter, concluding with —.—.—. The text only is repeated and the message ends with OXB OXB OXB —.—.—.

Example: —.—.— OXB OXB OXB, ice report 26w. Kattegat west channel, closed for sailing vessels; east channel, pack ice, steamers beset; southern part, open ice. Sound and belts, drift ice, along west coast pack ice. All light vessels removed. —.—.— (Repetition of foregoing.) OXB OXB OXB —.—.—.—From Admiralty Notice to Mariners, September 28, 1922.

¹ Not in commission.

² In commission for continuous service.

³ Limited commission available for bearings during foggy weather.

DESCRIPTION OF LOADING COIL, CONDENSERS, AND ELECTRON-TUBE UNITS FOR VERY SIMPLE RADIO RECEIVING SETS.

The Bureau of Standards has prepared a series of pamphlets which give descriptions of parts of very simple radio receiving sets. Two of the series have been published and announced previously and are available from the Superintendent of Documents, Washington, D. C. They are Circular No. 120, Construction and Operation of a Simple Homemade Radio Receiving Outfit, and Circular No. 121, Construction and Operation of a Two-Circuit Radio Receiving Equipment with Crystal Detector. The later pamphlets of the series, describing a simple loading coil, auxiliary condensers, and electron-tube detector and amplifier units, have now been prepared. They are included in Letter Circulars Nos. 46, 47, 48, 49 of the Bureau of Standards and are not now available to the public. They will be printed, and the time when they become available will be announced in the Radio Service Bulletin, a monthly publication of the Department of Commerce, obtainable from the Superintendent of Documents, Washington, D. C., for 25 cents per year.

The description of auxiliary condensers includes two fixed condensers, one of which is connected in series with the antenna to adjust to short wave lengths and the other of which is connected across the telephone receivers. The purpose of the loading coil described in one pamphlet is to extend the range of the receiving equipment so as to respond to wave frequencies between 100 and 500 kilocycles (that is, wave lengths between 3,000 and 600 meters).

The electron-tube detector unit described may be used instead of the crystal detector with either the single-circuit or two-circuit radio receiving sets described in Bureau of Standards Circulars Nos. 120 and 121. It makes the receiving set operate for signals from transmitting stations at greater distances. The audio-frequency amplifier unit described in another of the pamphlets employs a single electron tube. The amplifier unit is used by connecting it to the receiving set in place of the telephone receivers and then connecting the telephone receivers to the output of the amplifier. The distance over which the receiving set receives signals is increased by the use of one or more of these amplifier units.

DIRECTIVE RADIO TRANSMISSION ON A WAVE LENGTH OF 10 METERS.

The enormous increase in the use of radio telegraphy and telephony during the past two years has created a demand for apparatus capable of being operated with a minimum of interference. Wherever the need is not for broadcasting but for point-to-point communication the case seems hopeless, unless directive transmission can make it possible. Directional transmission on very short wave lengths (below 20 meters) may offer a solution to this problem.

Recent reports by Marconi, Franklin, and others show that interesting and valuable data have been obtained on directive radio transmission using wave lengths below 20 meters. The Bureau of Standards has just completed a series of similar experiments, the preliminary results of which confirm the work of these investigators. The experiments conducted at the Bureau of Standards were made with a parabolic reflector (cylindrical type), which was designed for a 10-meter wave length. It was made by constructing a parabolic wooden frame with an aperture of one wave length. This frame was suspended in the air and 40 wires spaced 1 foot apart were suspended from it. The source, located at the focus, consisted of a 50-watt electron tube. The output from this tube was coupled to an antenna, which was a linear oscillator of the Hertzian type, which was tuned to a wave length of 10 meters. The complete reflector system was arranged so that it could be rotated.

Numerous polar curves were obtained by rotating the reflector and taking readings of the received current at every 10° position of the reflector. The receiving apparatus was located 170 feet from the reflector in most of the work and consisted of a loop antenna (single turn) with a thermoelement in the loop circuit. A portable galvanometer was connected to the thermoelement.

With all adjustments correctly made at the reflector, good directional transmission was obtained. With the reflector turned 20° from the direct line to the receiver, the received current dropped off to one-half of what it was with the reflector directed to the receiver. There was practically no radiation over an angle of 270° , while the majority of the radiated power was confined to an angle of 30° . Good radiophone transmission was obtained over a distance of 3 miles.

The report to be issued on this work will present the results of these experiments and give details regarding the apparatus and circuits used, so that others may duplicate or continue this line of investigation. When the publication is issued, details

regarding it and information as to how it may be obtained will be published in the Radio Service Bulletin, obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 25 cents per year.

PUBLICATION ON PROPERTIES OF ELECTRICAL INSULATING MATERIALS.

The Bureau of Standards has just published a paper giving the results of extensive research on the laminated phenolmethylenes type of insulating materials. This publication, Technologic Paper No. 216, Properties of Electrical Insulating Materials of the Laminated Phenol-Methylene Type, by J. H. Dellinger and J. L. Preston, is now obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 30 cents.

The manufacture of these electrical insulating materials is an industry that has become commercially important within the last 20 years.

This paper is concerned only with materials of the laminated type, which are made up by building up to some desired thickness sheets of paper, fiber, or fabric which has been previously impregnated or coated with phenol (synthetic) varnish and then subjecting the stack to comparatively great pressure in a heated hydraulic press. All the materials of this type on the market have been investigated; that is, Condensite Celoron, Bakelite Dilecto, Formica, and Bakelite Micarta. The properties or effects which have been measured for this type of material include radio frequency, phase difference, or power loss, dielectric constant, flash-over voltage, direct-current volume resistivity and surface resistivity, moisture absorption, thermal expansivity, and other properties. The data of these properties have been arranged in such a manner as to be conveniently available for reference either by a person desiring detailed information or by a person interested only in a general way.

INFORMATION ON RADIO MEASUREMENTS.

The Bureau of Standards has prepared a series of pamphlets which deal with radio measurements. These pamphlets are: Letter Circular No. 75, The Secondary Standardization of Radio Wave Meters, Letter Circular No. 76, the Standardization of Inductors at Radio Frequencies, and Letter Circular No. 77, The Comparison of Condensers at Radio Frequencies. Like the other publications in the Letter Circular series, they are in mimeographed form and are not obtainable by purchase. A limited supply of these is available at the bureau to persons who have actual use for such information.

The first pamphlet describes the method of standardizing wave meters of both the transmitting and receiving type. In the receiving type of wave meters the standardizing consists in measuring by means of a standard wave meter the frequencies emitted by a generator of continuous waves which is tuned to resonance with the wave meter under test at various settings of the scale with the latter. In the transmitting type of wave meters, which consists of a condenser, an inductor, and an exciting device, usually a battery and a buzzer coupled to the circuit, the standardizing process utilizes the make and break of the buzzer, which excites the wave meter by impact and emits waves whose frequency is regulated by the wave meter setting, the frequency of the waves emitted at each setting being known for each setting of the wave meter.

The second pamphlet describes the method of measuring the apparent inductance at any radio frequency of a fixed or variable inductor. The apparatus consists of a variable condenser, a wave meter standardized in terms of frequency or wave length, a thermoelement and galvanometer, current square meter, several noninductive resistors of known resistance, and a source of undamped unmodulated waves. The observations consist of the readings necessary for standardization in terms of frequency or wave length of the circuit composed of the standardized condenser, the inductor to be measured, and connecting leads spaced well apart and as short as is possible without bringing the coil to within about 10 centimeters of the condenser. With this circuit is combined the device used to indicate resonance.

The third pamphlet describes the method of comparison of the capacity and effective resistance or phase difference of two condensers one of which has already been standardized. The method here described is that of comparison by substitution; that is, tested and untested condensers are compared by inserting them in turn in a circuit which is brought to resonance with a source of undamped waves.

These three pamphlets are, primarily, for research and testing laboratories. Together, with Letter Circular No. 78, Design of a Suitable Short-Wave Radio Wave Meter, they constitute a supplement to Bureau of Standards Circular No. 74, Radio Instruments and Measurements.

PRECISION STANDARDIZATION OF RADIO FREQUENCIES.

The Bureau of Standards has developed a very precise method of standardization of radio wave lengths and frequencies, which is the fundamental basis of radio measurements in this country. By the process used the frequency of radio waves is compared with that of an audible musical note. A tuning fork is mounted in such a way that it may be made to control the frequency of an oscillatory circuit. The frequency of another oscillatory circuit operating at much higher frequencies is then compared with it by means of a cathode-ray oscillograph.

This latter instrument consists of the cathode-ray tube, a special kind of vacuum tube in which the narrow stream of electrons is subjected to the action of electric fields applied by the two alternating-current generators. When neither generator is operating, the electrons, impinging on the active screen at the end of the tube, cause a single luminous spot. If one generator is connected, the spot is deflected back and forth along the single line, horizontal or vertical, as the case may be, with such rapidity that it appears as a solid line. If both generators are applied simultaneously, the spot oscillates both horizontally and vertically and appears, in general, as a blurred luminous rectangle. If, however, the frequencies of the two generators bear a simple ratio, such as four to one, the spot traverses and retraverses a definite simple path, forming a figure by which the frequency ratio may be recognized. It has been found possible to compare frequency ratios as high as 21 to 1.

The bureau is at present engaged in the standardization of a high-precision standard wave meter by this means. A tuning fork of known frequency, approximately 1,000 cycles per second, is used as the basis of the standardization. A low-frequency generator is tuned to successive multiples of this frequency by means of the cathode-ray oscillograph, and corresponding settings of the wave meter are obtained. A third generator is similarly tuned to multiples of these frequencies, and thus by successive stages the standardization is extended to include frequencies as high as 5,000 kilocycles (60 meters). It is intended that this wave meter be used as the basic standard for the standardization of commercial wave meters.

MINUTES OF OPEN MEETINGS OF DEPARTMENT OF COMMERCE CONFERENCE ON RADIO TELEPHONY, FEBRUARY 27-28, 1922.

At the Radio Telephony Conference which was called in Washington on February 27, 1922, by Secretary Hoover, of the Department of Commerce, two days were spent in hearing the statements of representatives of the many radio interests who were present. The minutes of this open meeting have now been prepared in mimeographed form. Copies are available for reference at the offices of the District Radio Inspectors of the Department of Commerce. There is a very limited number on hand at the Bureau of Standards for supplying the requests of organizations particularly concerned with the work of the conference.

DESCRIPTION OF RADIO WORK OF THE BUREAU OF STANDARDS.

The radio laboratory of the Bureau of Standards of the Department of Commerce was established in 1910, and during the past few months parts of its work have come to the attention of most of the radio experimenters and radio broadcast listeners throughout the country. The work of the Bureau of Standards in radio research and measurements and in assisting the various Government bureaus in the solution of technical radio problems covers a wide scope.

A glimpse of what the Bureau of Standards is doing to increase the knowledge and extend the usefulness of radio is given in an article by J. H. Dellinger, chief of the radio section, entitled "The Bureau of Standards lends a hand." This article appears in the magazine Radio Broadcast for November, 1922.

PUBLICATION ON RADIO-FREQUENCY AMPLIFIERS.

Electron-tube amplifiers now form an essential part of all but the most simple radio receiving sets. Amplifiers may make use of either radio-frequency amplification, or audio-frequency amplification, or both. For satisfactory reception with coil antennas it is generally found necessary to use radio-frequency amplification.

There are three methods of coupling the output of one tube into the input of another tube, so as to provide a multistage amplifier of radio-frequency current: (1) Resistance coupling, (2) tuned plate-circuit coupling, and (3) transformer coupling. A paper entitled "Radio-frequency amplifiers," by P. D. Lowell, has just been issued as Bureau of Standards Scientific Paper No. 449. This paper deals, for the

most part, with transformer coupling and gives circuits and constructional details for transformers with both "air cores" and iron cores. The paper can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents.

FEES FOR RADIO TESTS.

The Bureau of Standards has prepared a pamphlet, Letter Circular No. 73, Fees for Testing Radio Apparatus, for the information of those who desire to have tests performed. The bureau limits its tests of radio materials to tests for the Government, tests of instruments, which in turn are to be used as standards, tests of importance to the bureau for research, tests in which the bureau is to act as referee, and a few other special tests in which special reason is shown why these tests are to be undertaken by the bureau. Before an article is submitted for test it must be preceded by a written request for test, and if it can not be undertaken the applicant is furnished, if possible, with the name and address of one or more laboratories who may make the test if requested.

The request should enumerate the articles, giving serial numbers or other identification marks, if any, should state the nature of the test desired and the conditions under which the apparatus is used, and state his reasons for believing that the test should be made by the Bureau of Standards. There is a limited number of copies of this fee schedule available at the Bureau of Standards to persons who have actual use for it.

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CORRECT CALL LETTERS OF SWAN ISLAND STATION.

The correct call letters of the Swan Island radio station mentioned in connection with the transmission of weather reports in the October edition of this publication, pages 11 and 12, are US.

NEW LIST OF RADIO STATIONS OF THE UNITED STATES.

The new edition of the List of Commercial and Government Radio Stations of the United States, edition June 30, 1922, is available from the Superintendent of Documents, Government Printing Office, Washington, D. C., price 15 cents per copy.

WEATHER PREDICTION IN CONNECTION WITH RECENT HURRICANE.

The Weather Bureau advises in connection with the recent hurricane which occurred in the Yucatan Channel and southern Gulf of Mexico during the latter part of last month that the warnings issued by the Weather Bureau were promptly received by cable and by Swan Island. These messages were broadcasted by radio and by notices to mariners as fast as received by the Panama Canal office. They were instrumental in causing some of the boats in the New Orleans trade to postpone their sailings for a day or two. So far not many marine casualties have been reported. The canal and shipping interests appreciate the prompt service given by Forecaster Mitchell and the Swan Island radio station.

OFFICIAL MAP OF RADIOTELEGRAPH STATIONS.

The International Bureau of the Telegraphic Union, Berne, Switzerland, is publishing a map of radiotelegraph stations. The map is in five sections. Sections 1 and 2 of the map are ready for distribution. Sections 3, 4, and 5 will be ready in the near future. The map indicates the coast stations, the routes of the principal lines of navigation, the length and duration of voyages. The price of each sheet of the map is 3 francs (Swiss money), post charges and packing included. The shipments are made only after receipt of the price of the sections ordered, either by postal check or by check payable to the Berne bureau. The information of the map will be kept up to date by bulletins which will appear whenever the information warrants such. The price of these bulletins is included in the cost of the map. All remittances should be forwarded to the "International Bureau of the Telegraphic Union, Radiotelegraph Service, Berne, Switzerland."

CHANGE IN RATE FOR BOSTON (WBF) STATION.

Effective December 1, next, the rate for the Boston station of the Tropical Radio Telegraph Co. will be 10 cents per word in lieu of 12 cents per word.

WEATHER REPORT BY WHITEFISH POINT (MICH.) NAVAL STATION.

Beginning on the 15th of this month, weather will be broadcasted twice daily from the naval radio station at Whitefish Point, Mich. (NZT), on a wave length of 1,200 meters. Times of transmission: 10.45 a. m. and 4.45 p. m. (seventy-fifth meridian). Position of station: 84° 57' 21" N., 46° 46' 10" W.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, December 1, 1922—No. 68

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name	=Name of station.
Loc.	=Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call	=Call letters assigned.
System	=Radio system used and sparks per second.
Range	=Normal range in nautical miles.
W. I.	=Wave lengths assigned: Normal wave lengths in italics.
Service	=Nature of service maintained:
	PG=General public.
	PR=Limited public.
	RC=Radio compass station.
	P=Private.
	O=Government business exclusively.
Hours	=Hours of operation.
	N=Continuous service.
	X=No regular hours.
	m=a. m. (12 m.=midday).
	s=p. m. (12 s.=midnight).
Rates	=Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co.	=Independent Wireless Telegraph Co.
R. C. A.	=Radio Corporation of America.
S. O. R. S.	=Ship Owners' Radio Service.
C. w.	=Continuous wave.
I. c. w.	=Interrupted continuous wave.
V. t.	=Vacuum tube.
FX.	=Fixed station.

CERTIFICATE: By direction of the Secretary of Commerce this publication is issued as an administrative report and is required for the proper transmission of the public business.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Aberdeen, Wash. ¹	KZE	300, 450, 550, 600..	PR	X	Grays Harbor Stevedore Co.
Fresno, Calif. ²	KDNU	425.....	P	X	San Joaquin Light & Power Corp.
Guntersville, Ala. ³	WKH	540.....	P	X	Nashville, Chattanooga & St. Louis Ry.
Los Angeles, Calif. ⁴	KPK	540.....	P	X	Los Angeles Examiner.
Miami Beach, Fla. ⁵	WAX	300, 450, 600, 1650, 1800.	PG & PR	N	T. R. T. Co.
Stanford University, Calif. ⁶	KFGH	410.....	P	X	Leland Stanford University.
St. Croix Falls, Wis. ⁷	WPL	525.....	P	X	Northern States Power Co.
Tullahoma, Tenn. ⁸	WJJ	540.....	P	X	Nashville, Chattanooga & St. Louis Ry.

¹ Loc. (approximately) 0.123° 50' 00", N. 46° 59' 00"; range, 300; system, Kilbourne & Clark, 1000; rates none.

² Loc. (approximately) 0.119° 49' 00", N. 36° 43' 00"; range, 125; system, composite, v. t. and composite spark, 1000.

³ Loc. (approximately) 0.86° 20' 00", N. 34° 25' 00"; range, 300; system, composite, 232.

⁴ Range, 150; system, composite, v. t. telephone and telegraph (portable station).

⁵ Loc. 0.25° 48' 21", N. 80° 07' 15"; range, 300; system, Navy-Wireless Specialty Apparatus Co., 480 and 1000; rates, ship service 10c. per word.

⁶ Loc. 0.122° 10' 12", N. 37° 25' 35"; range, 150; system, composite, v. t. telephone.

⁷ Loc. (approximately) 0.92° 40' 00", N. 45° 04' 00"; range, 100; system, composite, v. t. telephone.

⁸ Loc. (approximately) 0.86° 15' 00", N. 35° 23' 00"; range, 300; system, composite, 232.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.	Service.	Hours.	Owner of vessel.	Station controlled by—
Hugh Kennedy ¹	KFCJ	.....	PG	X	Buffalo S. S. Co.....	I. W. T. Co.
Indian ²	KFEK	8	PG	X	Merchants & Miners Transportation Co.	
Ohio.....	KFCS	8	PG	X	E. W. Scripps.....	R. C. A.
Seaward.....	KFEH	.....	.....	.....	C. B. De Mille Productions (Inc.)	
Stephen M. Clement.....	KFBX	.....	PG	X	American S. S. Co.....	Do.
St. Michael.....	KFCO	.....	PG	X	Nicola Filiberto.....	
Tamarack IV ³	KFBW	8	PG	X	Dr. H. N. Torrey.....	

¹ Range, 150; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, 600; rates, Great Lakes service 2 c. per word.

² Range, 150; system, R. C. A., 240; w. l., 300, 600.

³ Range, 200; system, R. C. A., v. t. telephone and telegraph; w. l., 300, 450, 600.

Commercial land and ship stations, alphabetically by call signals.

[b—ship station; c—land station.]

Call signal.	Name.	Call signal.	Name.
KDNU	Fresno, Calif. ....c	KFZZ	General call for all I. W. T. Co. vessels. b
KFBW	Tamarack IV. ....b	KFGH	Stanford University, Calif. ....b
KFBX	Stephen M. Clement. ....b	KPK	Los Angeles, Calif. (portable) ....c
KFCJ	Hugh Kennedy ....b	KZE	Aberdeen, Wash. ....c
KFCO	St. Michael. ....b	WAX	Miami Beach, Fla. ....c
KFCS	Ohio. ....b	WJJ	Tullahoma, Tenn. ....c
KFEH	Seaward. ....b	WKH	Guntersville, Ala. ....c
KFEK	Indian. ....b	WPL	St. Croix Falls, Wis. ....c
KFOG	General call for all North Atlantic ice patrol vessels.b		

Broadcasting stations, alphabetically by names of cities.

[Additions to the List of Radio Stations of the United States, edition June 30, 1922.]

City.	Call signal.	City.	Call signal.
Astoria, Oreg.	KFGG	Lawrenceburg, Tenn.	WOAN
Baltimore, Md.	WNAY	Mishawaka, Ind.	WOAO
Casper, Wyo.	KFCQ	Okmulgee, Okla.	WPAC
Casper, Wyo.	KFDF	Omaha, Nebr.	WOAW
Charleston, S. C.	WNAQ	Parsons, Kans.	WOAJ
Charleston, S. C.	WOAH	Polytechnic, Mont.	KFED
Chicago, Ill.	WPAD	Portsmouth, Va.	WOAQ
Colorado Springs, Colo.	KFCQ	San Antonio, Calif.	KFCL
Columbus, Ohio.	WPAL	San Diego, Calif.	KFFA
Fort Monroe, Va.	WNAW	Scranton, Pa.	WRAV
Frankfort, Ky.	WOAK	Spokane, Wash.	KFDC
Grove City, Pa.	WSAJ	Stamford, Tex.	WOAZ
Honolulu, Hawaii.	KYQ	Stanford University, Calif.	KFGH
Houston, Tex.	WRAA	Tacoma, Wash.	KFEJ
Independence, Mo.	WPAG	Tecumseh, Nebr.	WTAU
Johnstown, Pa.	WOAP	Topeka, Kans.	WPAM
Kalamazoo, Mich.	WOAR	Tyler, Tex.	WOAF
Kenosha, Wis.	WOAN	Yankton, S. Dak.	WNAX
Knoxville, Tenn.	WNAV	Webster Groves, Mo.	WOAL

Stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 and 400 meters), alphabetically by call letters.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922.]

Call signal.	Station operated and controlled by—	Location of station.	Wave lengths.
KFCQ	Colorado Springs Radio Co.	Colorado Springs, Colo.	360
KFCQ	Los Angeles Union Stock Yards.	San Antonio, Calif.	485
KFCQ	Motor Service Station (Norman R. Hood).	Casper, Wyo.	360
KFDF	Radio Supply Co. (E. B. Craney).	Spokane, Wash.	360
KFDF	Wyoming Radio Corp.	Casper, Wyo.	360
KFED	Billings Polytechnic Institute.	Polytechnic, Mont.	360
KFEJ	Guy Greason.	Tacoma, Wash.	360
KFFA	Dr. R. O. Shelton.	San Diego, Calif.	360
KFGG	Astoria Budget.	Astoria, Oreg.	360
KFGH	Leland Stanford University.	Stanford University, Calif.	360
KYQ	Electric Shop.	Honolulu, Hawaii.	360
WNAQ	Charleston Radio Electric Co.	Charleston, S. C.	360
WNAV	Peoples Telephone & Telegraph Co.	Knoxville, Tenn.	360
WNAW	Peninsular Radio Club (Henry Kunzmann).	Fort Monroe, Va.	360
WNAX	Dakota Radio Apparatus Co.	Yankton, S. Dak.	360
WNAY	Ship Owners Radio Service.	Baltimore, Md.	360
WOAF	Tyler Commercial College.	Tyler, Tex.	360
WOAH	Palmetto Radio Corp.	Charleston, S. C.	360
WOAJ	Ervin Electrical Co.	Parsons, Kans.	360
WOAK	Collins Hardware Co.	Frankfort, Ky.	360
WOAL	William E. Woods.	Webster Groves, Mo.	360
WOAN	Vaughn Conservatory of Music (James D. Vaughn).	Lawrenceburg, Tenn.	360
WOAP	Kalamazoo College.	Kalamazoo, Mich.	360
WOAO	Lyradion Manufacturing Co.	Mishawaka, Ind.	360
WOAQ	Portsmouth Radio Association (Dr. C. T. Mercer).	Portsmouth, Va.	360
WOAR	Henry P. Lundskow.	Kenosha, Wis., 1066 Sheridan Road.	360
WOAW	Woodmen of the World.	Omaha, Nebr.	360
WOAZ	Penick Hughes Co.	Stamford, Tex.	360
WPAC	Donaldson Radio Co.	Okmulgee, Okla.	360
WPAD	W. A. Wieboldt & Co.	Chicago, Ill.	360
WPAG	Central Radio Co.	Independence, Mo.	360
WPAL	Superior Radio & Telephone Equipment Co.	Columbus, Ohio.	360
WPAM	Auerbach & Guettel.	Topeka, Kans., 709 Kansas Avenue.	360
WRAA	Rice Institute.	Houston, Tex.	360
WRAV	Radio Sales Corp.	Scranton, Pa.	360
WSAJ	Grove City College.	Grove City, Pa.	360
WTAC	Penn Traffic Co.	Johnstown, Pa.	360
WTAU	Ruegg Battery & Electric Co.	Tecumseh, Nebr.	360

Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
President.....	NURL	Post Office Department.

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922.]

Station.	Call signal.	Wave lengths.	Station controlled by—
Atlanta, Ga.	4KN	300, 375, 375...	Bryan Electric Co.
Cherrydale, Va.	3XD	150, 300, 225, 250.	Edwin L. White, 1 Columbia Street.
Chicago, Ill.	9XU	Variable	Midwest Radio Central, Drake Hotel.
Cincinnati, Ohio.	8XT	300, 375, variable.	Crosley Manufacturing Co.
Columbus, Ohio.	8XR	300, 375.	Entrekin Electric Co.
Detroit, Mich.	8XZ	Variable	Radio Inspector, eighth district.
Fulton, Calif.	6XAN	Variable	Bryan H. Dennis, 115 West Amerige Avenue.
Fulton, Mo.	9YR	300, 375.	Westminster College.
Helena, Mont.	7ZC	300, 375.	Fred C. Ashall, 536 North Warren Street.
Hoboken, N. J.	2XAJ	175, 300, 375, 290.	Delaware, Lackawanna & Western R. R. Co.
Hood River, Oreg.	7ZA	300, 375.	H. B. Read (The Radio Shop).
Los Angeles, Calif.	6XK	Variable	Reginald P. MacKenzie, 1016 Fourth Avenue.
Los Angeles, Calif.	6XT	Variable	Bible Institute of Los Angeles.
Memphis, Tenn.	5ZB	300, 375.	Walker L. Wellford, jr., 205 South Belvedere Boulevard.
Minneapolis, Minn.	9ZT	300, 250, 375.	Donald C. Wallace, 54 North Pennsylvania Avenue.
North Little Rock, Ark.	5ZR	300, 375.	Hobart J. Bell, 1501 Main Street.
Oklahoma City, Okla.	5XG	175, 300, 375.	National Radio Manufacturing Co.
Port Jefferson, N. Y.	2XS	5000, 5500.	R. C. A., 233 Broadway, New York, N. Y.
Rochester, N. Y.	8XQ	Variable	Rochester Gas & Electric Corp., 34 Clinton Avenue North.
Rolla, Mo.	9YN	300, 375.	Missouri School of Mines and Metallurgy.
San Diego, Calif.	6XAI	Variable	W. K. Ashill, 5038 Cliff Place.
Seattle, Wash.	7XR	Variable	Louis Wassmer, 419 Thirteenth Street North.
Seattle, Wash.	7XS	Variable	Brott Laboratories, 2045b Forty-second Avenue North.
Stockton, Calif.	6XAL	Variable	Paul Oard, 1217 East Street North.
Underwood, Wash. (near).	7XQ	Variable	Northwestern Electric Co., Pittock Block, Portland, Oreg.
Washington, D. C.	3XI	Variable	Catholic University of America.

Special land stations, grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
2XAJ	Second district:	7XQ	Seventh district:
2XS	Hoboken, N. J.	7XR	Underwood, Wash. (near).
	Port Jefferson, N. Y.	7XS	Seattle, Wash.
3XD	Third district:	7ZA	Seattle, Wash.
3XI	Cherrydale, Va.	7ZC	Hood River, Oreg.
4XN	Washington, D. C.		Helena, Mont.
	Fourth district: Atlanta, Ga.	8XQ	Eighth district:
5XG	Fifth district:	8XR	Rochester, N. Y.
5ZB	Oklahoma City, Okla.	8XT	Columbus, Ohio.
5ZR	Memphis, Tenn.	8XZ	Cincinnati, Ohio.
	North Little Rock, Ark.		Detroit, Mich.
6XAI	Sixth district:	9YN	Ninth district:
6XAL	San Diego, Calif.	9YR	Rolla, Mo.
6XAN	Stockton, Calif.	9XU	Fulton, Mo.
6XK	Fulton, Calif.	9ZT	Chicago, Ill.
6XT	Los Angeles, Calif.		Minneapolis, Minn.
	Los Angeles, Calif.		

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

- CAGAYAN DE SULU, P. I.—Loc. (approximately) 0.118° 30' 30", N. 06° 30' 30", range, 500.
 BALABAC, P. I.—Loc. (approximately) 0.117° 00' 30", N. 07° 59' 00"; range, 300; system, Marconi; w. l., 600, 1200; service, PG; hours, 8 a. m.—12 noon, 2–5.30 p. m., and on Sundays and holidays from 8–10 a. m., 4–5.30 p. m.; ship schedule first 10 minutes of every hour.
 DEARBORN, MICH.—System, composite, v. t., telephone, and telegraph.
 HONOLULU, HAWAII (KYQ).—Strike out all particulars.
 NORTHVILLE, MICH.—System, De Forest, v. t. telephone and telegraph.
 TULSA, OKLA.—W. l., 1640.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

NOTE.—(U. S. L.) after operating company denotes that the change applies to the List of Radio Stations of the United States only; does not apply to the Berne list. Hereafter where the rate is given without the service specifically stated—that is, North and South American and transoceanic services—it should be understood that the rate is for both classes of service. When the rate is for one class of service only, the class of service will be stated.

- ACHILLES.—Station operated and controlled by owner of vessel.
 AQUARIUS.—W. l., 300, 450, 600.
 BARRYTOWN.—System, Telefunken, 1000; station operated and controlled by R. C. A.
 BARSTOW.—Station operated and controlled by S. O. R. S.
 BASCOBEL.—W. l., 300, 450, 600.
 CAPE MAY.—W. l., 300, 450, 600.
 C. A. SMITH.—Rates, transoceanic 8 c. per word.
 CEDARHURST.—Station operated and controlled by I. W. T. Co.
 CELILO.—Chas. R. McCormick S. S. Co., owner of vessel.
 CHALLAMBA.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600; rates, 8 c. per word.
 CITY OF EVERETT.—Abram I. Kaplan, owner of vessel.
 COLUMBIA.—System, Federal arc, 360 with chopper.
 COLON.—Station operated and controlled by owner of vessel.
 COURTOIS.—Name changed to Munmotor.
 COWICHE.—Station operated and controlled by owner of vessel.
 CRASTER HALL.—System, R. C. A., 1000.
 DARIEN.—Station operated and controlled by owner of vessel.
 DELCO.—Name changed to Domino; station operated and controlled by R. C. A.
 DEUEL.—W. l., 300, 450, 600.
 D. F. McALLISTER.—W. l., 300, 450, 600.
 DIO.—W. l., 300, 450, 600; hours, X.
 DOCHET.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, 600.
 EASTERN KNIGHT.—System, Navy-Marconi, 1000.
 EASTERN LEADER.—W. l., 300, 450, 600.
 EGLANTINE.—W. l., 300, 450, 600; station operated and controlled by R. C. A.
 ELDNA.—W. l., 300, 450, 600.
 ELMSPORT.—W. l., 300, 450, 600.
 GENERAL G. W. GOETHALS.—Station operated and controlled by owner of vessel.
 GENERAL O. H. ERNST.—Station operated and controlled by owner of vessel.
 GENERAL W. C. GORGAS.—W. l., 300, 450, 600.
 GEORGE ALLEN.—W. l., 300, 450, 600.
 HAMER.—General Petroleum Corp., owner of vessel.
 HASTNAL.—W. E. Price, owner of vessel.
 HENRY D. WHITON.—Range, 200; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600; rates, 8 c. per word; station operated and controlled by S. O. R. S.
 HERIDA.—W. l., 300, 450, 600.
 HIGHO.—W. l., 300, 450, 600.
 HULVER.—Station operated and controlled by R. C. A.
 JAMES MACNAUGHTON.—Station operated and controlled by R. C. A.
 J. R. GORDON.—Range, 200; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600; rates, 8 c. per word.

KEWANEE.—Associated Oil Co., owner of vessel.
 LABETTE.—W. 1., 300, 450, 600.
 LAKE FIFE.—System, Navy-Marconi, 1000; w. 1., 300, 450, 600.
 LAKE FLORIAN.—Lykes Bros. S. S. Co., owner of vessel.
 LAKE FORNEY.—New Hampshire S. S. Co., owner of vessel.
 LAKE TIPPAAH.—Philadelphia and Norfolk S. S. Co., owner of vessel.
 LANCASTER.—Station operated and controlled by S. O. R. S.
 MACON.—W. 1., 300, 450, 500, 600.
 MAGNERIC.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. 1., 300, 450, 600.
 MEDON.—Alaska S. S. Co., owner of vessel.
 MONTPELIER.—American Ship & Commerce Navigation Corp., owner of vessel.
 MULTNOMAH.—Charles R. McCormick S. S. Co., owner of vessel.
 NEPONSET.—System, Navy-Lowenstein, 1000.
 NYANZA.—Name changed to Commercial Guide; Nyanza S. S. Co., owner of vessel.
 PINELLAS.—Name changed to Carolinas; Carolina S. S. Corp., owner of vessel; station operated and controlled by R. C. A.
 PLAYA.—Name changed to Paul Shoup.
 PUENTE.—Name changed to W. W. Mills.
 ROBIN HOOD.—W. 1., 300 440, 550, 600.
 SAGUA.—W. 1., 300, 450, 600.
 SOCONY 88.—Standard Transportation Co., owner of vessel.
 SOCONY 92.—Standard Transportation Co., owner of vessel.
 STEELORE.—Range, 300; system, R. C. A., 1000; w. 1., 300, 600.
 STEEL TRAVELER.—Range, 300; system, R. C. A., 1000; w. 1., 300, 450, 600; station operated and controlled by R. C. A.
 ULYSSES.—Station operated and controlled by owner of vessel.
 VABA.—Station operated and controlled by I. W. T. Co.
 WAHKEENA.—Charles R. McCormick S. S. Co., owner of vessel.
 WAPAMA.—Charles R. McCormick S. S. Co., owner of vessel.
 WEST CANON.—W. 1., 300, 600, 1800.
 WESTERN SCOUT.—Correct call signal WXE A.
 WESTERN WORLD.—Range, 300; system, Navy-Kilbourne & Clark, 1000; w. 1., 300, 450, 600; hours, X.
 WEST HAVEN.—Station operated and controlled by R. C. A.
 WEST MODUS.—Station operated and controlled by I. W. T. Co. (U. S. L.).
 WILLAMETTE.—Charles R. McCormick S. S. Co. owner, of vessel.
 WILLHILO.—Williams S. S. Co. owner, of vessel.
 Strike out all particulars of the following-named vessels: H. M. Whitney; James S. Whitney; Lyman Stewart; and Pleiades.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDSS, name changed to W. W. Mills; KDTE, name changed to Paul Shoup; KIZB, name changed to Domino; KULB, name changed to Carolinas; WJO, name changed to Commercial Guide; WVOI, name changed to Munmotor; strike out all particulars following the call signals, KYQ, WNP, WPFV, WPW, and WTL.

BROADCASTING STATIONS, BY CALL SIGNALS.

Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922.]

KDYQ (Portland, Oreg.).—W. 1., add 360.
 KFAV (Venice, Calif.).—Station operated and controlled by Abbot Kinney Co.
 KFBK (Sacramento, Calif.).—W. 1., add 485.
 KFBM (Astoria, Oreg.).—Station operated and controlled by Cook & Foster and Astoria Hardware Co.
 KFBD (San Francisco, Calif.).—W. 1., 400, 485; station operated and controlled by Mercantile Trust Co. of California.
 KHD (Colorado Springs, Colo.).—W. 1., add 360.
 KHJ (Los Angeles, Calif.).—W. 1., 400, 485; station operated and controlled by Times-Mirror Co.
 KNT (Aberdeen, Wash.).—Station operated and controlled by Grays Harbor Radio Co. (Walter Hemrich).
 KZC (Seattle, Wash.).—Station operated and controlled by Public Market and Department Stores Co.
 WAAN (Columbia, Mo.).—W. 1., add 485.
 WBAD (Minneapolis, Minn.).—Station operated and controlled by Sterling Electric Co.

WBZ (Springfield, Mass.).—W. 1., 400.
 WEAB (Fort Dodge, Iowa).—W. 1., add 485.
 WFAA (Dallas, Tex.).—Station operated and controlled by Dallas News and Dallas Journal.
 WFAD (Salina, Kans.).—Station operated and controlled by Watson Weldon Co.
 WGF (Des Moines, Iowa).—W. 1., add 485.
 WHAL (Lansing, Mich.).—Station operated and controlled by Lansing Capital News.
 WHK (Cleveland, Ohio).—Station operated and controlled by Radiovox Co. (Warren R. Cox).
 WIP (Philadelphia, Pa.).—W. 1., add 485.
 WLAI (Waco, Tex.).—W. 1., add 485.
 WLAT (Burlington, Iowa).—Station operated and controlled by Radio and Specialty Co.
 WMAM (Beaumont, Tex.).—W. 1., add 485.
 Strike out all particulars of the following-named stations: KDYN, Redwood City, Calif.; KDYU, Klamath Falls, Oreg.; KDZD, Los Angeles, Calif.; KDZJ, Eugene, Oreg.; KFAB, Portland, Oreg.; WBAE, Peoria, Ill.; WBAQ, South Bend, Ind.; WDAA, Nashville, Tenn.; WDAW, Atlanta, Ga.; WEAZ, Waterloo, Iowa; WFAL, Houston, Tex.; WFAP, Peoria, Ill.; WFAX, Binghamton, N. Y.; WGAF, Tulsa, Okla.; WHAN, Wichita, Kans.; WHAT, Yale, Okla.; WIAG, Birmingham, Ala.; WIAN, Allentown, Pa.; WKAJ, Fargo, N. Dak.; WKAT, Frankfort, Ind.; WMAU, Shreveport, La.; WSV, Little Rock, Ark.; WTK, Paris, Tex.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

FORT D. A. RUSSEL.—Correct orthography Fort D. A. Russell.

VLADIVOSTOK, RUSSIA.—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NPH, strike out all particulars and WVV read Fort D. A. Russell.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922.]

BALTIMORE, MD. (3XX).—Address 2817 Windsor Avenue.
 CONWAY, ARK. (5XAC).—W. 1., 200, 375, variable.
 DAYENPORT, IOWA (9XAC).—W. 1., 250, 375, variable; address 5000 Brady Street.
 EL PASO, TEX. (5ZAD).—Address 809 North Oregon Street.
 GRAND COTEAU, LA. (5XZ).—W. 1., 200, 375.
 GREAT NECK, N. Y. (2XAN).—Address 20 West Thirty-fourth Street, New York, N. Y.
 KALAMAZOO, MICH. (8XF).—W. 1., add 500.
 LITTLE ROCK, ARK. (5XAB).—Station operated and controlled by Dr. L. M. Hunter only.
 LOS ANGELES, CALIF. (6ZAA).—Changed to Pasadena, Calif., 647 North Madison Avenue.
 MONTGOMERY, ALA. (5XR).—Address 7 Walnut Street.
 PHILADELPHIA, PA. (3XB).—Station operated and controlled by W. C. Elgin, 1000 Chestnut Street.
 PITTSBURGH, PA. (8ZAE).—Address 3220 Orleans Street.
 WACO, TEX. (5ZAF).—Station operated and controlled by Sanger Bros.
 WASHINGTON, D. C. (3XAF).—W. 1., 1650, 2500, variable.
 Strike out all particulars of the following-named stations: Asheville, N. C. (4ZD); Detroit, Mich. (8XO); Hoboken, N. J., Car No. 782 (2XAJ); Madison, Wis. (9XL); Milwaukee, Wis. (9YZ); Minneapolis, Minn. (9ZT); Portland, Oreg. (7XG); St. Paul, Minn. (9ZAH).

MISCELLANEOUS.

GENERAL CALL SIGNAL ASSIGNED TO ICE PATROL VESSELS.

Call letters KFOG have been assigned to all ice patrol vessels of the North Atlantic International Ice Patrol. Any vessel desiring to communicate with the vessel on patrol regarding conditions in the ice fields should use the above-mentioned signal.

INTERFERENCE BY EXPERIMENTAL STATIONS.

Experimental stations should, as far as possible, avoid using a radiating antenna for testing while other stations in the vicinity, including broadcasting stations, are operating. The early morning hours are probably best suited for testing. See paragraph 3, section 4, act of August 13, 1912.

COMPASS STATIONS CLOSED TEMPORARILY.

On the 14th of last month service was suspended from the radio compass stations at Fort Stevens, Oreg. (NPE), and Ocean Park, Wash. (NPE), pending installation of temporary transmitters. The period during which service will be suspended is not known at present.

RECONSTRUCTION OF THE SCHEVENINGEN RADIO STATION.

The Netherlands Government is preparing to enlarge the present radio station at Scheveningen. The station, which will be ready for operation in the early part of 1923, is designed to communicate with all parts of the continent of Europe and will be equipped also for wireless telephone broadcasting.

ALASKAN STATIONS CLOSED.

The station at Akutan (KMW) closed for the season on October 31, last.

CHANGE IN STATIONS TRANSMITTING WEATHER REPORTS.

Beginning on the 20th ultimo, weather broadcasts now transmitted from the United States naval radio station at Miami, Fla., will be transferred to the naval station at Jupiter, Fla. (NAQ). The weather will be broadcasted at 11.30 a. m. and 6 p. m. (seventy-fifth meridian time). Hurricane warnings will be broadcasted when issued and repeated at two-hour intervals until midnight. The transmission will be by spark on a wave length of 1688 meters. The position of this station is $0.80^{\circ} 06' 02''$, N. $26^{\circ} 56' 54''$.

INFORMATION FROM THE BERNE BUREAU.

Faro Islands.—Beginning November 1, this year, the charge for interior radiotelegraph messages within these islands will be 10 centimes per word; minimum, 1 franc for ordinary telegrams; and 30 centimes per word minimum, 3 francs for urgent radiotelegrams.

Portugal.—The coast station of Porto is now open for service.

Belgium.—The legal time was reestablished on October 8, last.

Denmark.—Beginning November 1, this year, the Danish interior charge will be 10 centimes per word; minimum, 1 franc.

Spain.—The coast station Vigo is provisionally closed for public service.

France.—The legal time was reestablished on October 8 last.

Norway.—Beginning November 1, this year, the interior charge on radiotelegrams originating in or destined to Norway will be 10 centimes per word, with a minimum of 1 franc for ordinary radiograms; and 30 centimes per word, with a minimum of 3 francs for urgent radiograms.

INFORMATION FROM THE HYDROGRAPHIC OFFICE.

Samoa Islands.—Apia radio station, call letters VMG, wave 600 meters (spark), transmits daily, at 0730 GMT, a weather bulletin containing a brief review of the local meteorological conditions, including barometric pressure, temperature, and the direction and force of the wind. Location (approximately) lat. $13^{\circ} 51' S.$, long. $171^{\circ} 48' W.$

Sweden (radio compass station, Hallo, the Skagerrack).—Hallo compass station, in lat. $58^{\circ} 20' 08'' N.$, lon. $11^{\circ} 13' 00'' E.$, was opened for general service on November 1, 1922. The station will determine the bearing of a vessel on the 600-meter wave. It is not equipped with a sending apparatus but is controlled by the Goteborg radio station, which will furnish the necessary information on a wave length of 600 meters. A vessel desiring bearings should call Goteborg (SAB). When that station has answered, the vessel sends the abbreviation "QTE." (What is my true bearing), followed by the call signal or call signals of the station or stations from which the bearings are desired. The vessel then waits for the signal "K." When this is received, the

vessel repeats its distinguishing signal, alternated by the letter "V," for a period of 50 seconds. This signal should be made slowly with the dashes considerably prolonged. Goteborg will then repeat the abbreviation "QTE" (Your bearing from was degrees), followed by the call signal of the radio station and a group of four figures (from 0000 to 3599). This group indicates the true bearing, in degrees and tenths of degrees, of the ship station from the radio compass station. Immediately after the vessel has received the bearings it should repeat the group of figures and give the customary signal for closing the message. Goteborg then repeats the closing signal.

Example: A vessel with the distinguishing signal "SGL" desires bearings from Vinga (SAL) and Hallo (SAM) radio compass stations. Goteborg radio station (SAB) is called:

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-.-.-.- SAB SAB SAB DE SGL SGL SGL -.-.-.-
-.-.-.- SGL SGL SGL DE SAB SAB SAB -.-.-.-
-.-.-.- SAB DE SGL -.-.-.- QTE -.-.-.- SAL SAM -.-.-.-
-.-.-.- SGL DE SAB -.-.-.-
-.-.-.- SGL -.-.-.- SGL SHL -.-.-.-
-.-.-.- etc. (less than 50 seconds) -.-.-.-
SGL -.-.-.-
-.-.-.- (This signal is made slowly and with prolonged dashes.)
SGL DE SAB -.-.-.- QTE SAL 2925
SAB 2030 -.-.-.- SAB -.-.-.-
-.-.-.- SAB DE SGL -.-.-.- SAL 2925 SAM
2030 -.-.-.- SGL -.-.-.-
-.-.-.- SGL DE SAB -.-.-.- SAB -.-.-.-

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A charge of 5 kronor (\$1.34) is made for a single bearing from Hallo or from Vinga. The maximum distance on which accurate bearings may be expected is about 150 miles. All steps have been taken to furnish bearings to a high degree of accuracy, but it must be understood, however, that the Swedish Telegraph Administration will incur no liability for any consequence which may result, directly or indirectly, from transmission of inaccurate bearings or from any other cause.

In order to obtain a check on the work of the radio compass station, a short report containing the following information should be sent to Kungl. Telegrafstyrelsens Radiobyra, Stockholm 2: (a) The name of the vessel, (b) the name of the radio compass station, (c) date and hour (Greenwich mean time) the vessel received the bearing, (d) the bearing received from the radio compass station, (e) the position of the vessel at the time in question, determined by other means than by radio bearings, (f) the probable accuracy of the estimated position of the vessel, (g) weather conditions at the time of obtaining the bearings, (h) eventual remarks, (i) the signature of the master or the responsible navigator.

CONFERENCE ON RADIO STANDARDIZATION.

The Bureau of Standards of the Department of Commerce has called a conference on radio standardization to be held on Friday, January 12, 1922, in New York City. The desirability of calling a general conference on radio standardization has been apparent in many ways, and this call is issued by the Bureau of Standards at the specific request of the following associations and organizations: Institute of Radio Engineers; National Radio Chamber of Commerce; Radio Apparatus Section, Associated Manufacturers of Electrical Supplies; National Retail and Dry Goods Association; American Radio Relay League; Radio Corporation of America.

These organizations have pointed out that there is need for greater uniformity in the methods of describing, rating, and testing of performance of radio apparatus. Invitations are being issued to all of the national associations of an engineering and technical nature which are known to be interested in radio standardization. The representation of radio manufacturers will, in general, be through the trade associations of which they are members. While it is desired to make the conference thoroughly and broadly representative, it is expected that the organizations invited will limit their representation to one or two persons in order that the conference may be as effective as possible.

The purpose of the conference is to consider, broadly, (1) whether a formulation of standards for radio apparatus and service shall be made; (2) if so, what general classes of apparatus or service should be included; and (3) what procedure shall be recommended for carrying out the conclusions reached by the conference. If the conference decides that radio standards should be formulated, it is expected that they will be prepared with special consideration of the wide range of interests which are con-

cerned with the subject, and that these standards may ultimately be adopted with the approval of the American Engineering Standards Committee as an American standard.

AMPLIFIER USING ALTERNATING-CURRENT SUPPLY.

A notice of the publication of a paper from the Bureau of Standards on the above subject in the Journal of the A. I. E. E. appeared in the issue of the Radio Service Bulletin for August 1, 1922, and stated that this paper would be available as a publication of the Bureau of Standards in a few months, and that a notice of the publication would appear in the Radio Service Bulletin. This paper has been issued as Bureau of Standards Scientific Paper No. 450, An Electron-Tube Amplifier using 60-Cycle Alternating Current to Supply Power for the Filaments and Plates, by P. D. Lowell. A copy of this paper may be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C.; price, 5 cents.

MULTILAYER COILS FOR RADIO APPARATUS.

In radio apparatus coils of more than one layer, or multiple-layer coils, are frequently used, particularly when it is desired to obtain a coil of comparatively large inductance in a small space. Multilayer coils are also used in many other fields of electrical work. A simple form of multilayer coil is wound layer upon layer in a channel of rectangular cross section. Coils of this type are useful in low-frequency work. Multilayer coils of this simple type, however, have a very considerable capacity between layers and are therefore not suitable for radio work in which the capacity of coils must be kept low. To reduce this capacity, means must be found either to reduce the potential between adjacent turns in different layers or to increase the distance between layers. The first method is employed in coils prepared with a "banked" winding, in which the wire is so carried as to achieve the winding of several layers simultaneously. For the method of increasing the distance between layers it is found that a small separation between wires brings about a very appreciable reduction of capacity, but beyond a moderate separation little is gained. In one type of coil adjacent layers are separated by thin pieces of insulation of perhaps 1 or 2 millimeters in thickness. In a type of coil known as "honeycomb" the wire is carried diagonally back and forth across the cross section while it is being wound, with the result that wires which run parallel to one another are separated by at least twice the diameter of the covered wire. In the design of electrical apparatus, and particularly radio apparatus, it is important to be able to calculate the inductance of the various types of multilayer coils.

Formulas for the inductance of simple types of multilayer coils have been derived by a number of scientists. It is also found that for the bank-wound, "honeycomb," and similar low-capacity windings used in radio work the same formulas apply as for a simple circular coil of rectangular cross section, provided that an appropriate correction be made for the space occupied by the insulation. The formulas are, however, complicated, and for any given case the necessary computation is tedious. Furthermore, there are a number of different formulas, some of which are most accurate for short coils, others for long coils or other particular types of coils, so that the engineer may find it difficult to select the formula which is best suited to his particular problem. If many calculations have to be made, some means of reducing the labor of computation and avoiding the difficulty of selecting the most suitable formula is a practical necessity.

Such aids which have heretofore appeared have taken the form of a single empirical formula to cover the whole range of types of coils or of charts from which the inductance, or some function simply related to the inductance, can be interpolated. These methods do not allow of an accuracy greater than about 1 per cent at best, and in some instances the curves have been based upon unsuitable formulas and give only a rough degree of accuracy.

There has recently appeared Bureau of Standards Scientific Paper No. 455, Tables for the Calculation of the Inductance of Circular Coils of Rectangular Cross Section, by Frederick W. Grover. This paper gives tables which have been carefully calculated, by means of which the inductance of multilayer coils may be quickly and accurately computed by the simplest of arithmetical operations. The tabulated values in the tables are correct to 1 part in 10,000. The necessity for long and tedious computations directly from the complicated formulas and for selecting the most suitable formula for a given case are thus avoided. The formulas on which the tables are based are collected for reference, and the theoretical problems involved and the limitations of each formula are discussed. Examples are given to illustrate and explain the use of the tables. The calculation of mutual inductance for certain

cases of multilayer coils is treated. This paper should be regarded as supplementary to Bureau of Standards Scientific Paper No. 169, Formulas and Tables for the Calculation of Mutual and Self-Inductance, which covers many different kinds of inductance coils. A copy of Scientific Paper No. 455 may be purchased for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.

BIBLIOGRAPHY AND PATENTS ON ELECTRICAL INSULATING MATERIALS.

During an investigation of the properties of certain types of electrical insulating materials which the Bureau of Standards has been conducting for several years a rather comprehensive bibliography has been prepared of papers, books, and other publications which cover various types of electrical insulating materials. During the course of this same investigation an examination was made of the patents on various types of electrical insulating materials, particularly materials of the phenolic type, as represented by United States patents issued on such materials and the methods of their manufacture. A list was compiled, after search, of the more important United States patents on such materials and methods. This list covers patents issued prior to September 1, 1920. It is expected that at a later date this list will be brought down to date.

Announcement has previously been made of the publication of Bureau of Standards Technologic Paper No. 216, Properties of Electrical Insulating Materials of the Laminated, Phenol-methylene Type, which can now be purchased for 30 cents per copy from the Superintendent of Documents, Government Printing Office, Washington, D. C. Space did not permit the publication in Technologic Paper No. 216 of the complete bibliography of insulating materials mentioned above or of the patent list mentioned.

A considerable demand has arisen for copies of the bibliography, and of the patent list, and these have been issued in mimeographed form as Bureau of Standards Letter Circular No. 50, Bibliography of Books and Periodicals on Tests, Properties and Uses of Electrical Insulating Materials, and Letter Circular No. 51, List of the More Important United States Patents Covering the Materials and Methods of Manufacture of Insulating Materials. Only a limited supply of these two Letter Circulars is available, but a copy will be sent on request to the bureau, so long as the supply lasts, to any person who can show actual use for it.

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CHANGE IN RATES FOR TROPICAL RADIO TELEGRAPH CO. STATIONS.

Effective the 1st instant, the radio stations operated by the above-named company at New Orleans, La. (WNU), Fort Morgan, Ala. (WIO), and Burrwood, La. (WBW), will charge 10 cents per word for ship traffic in lieu of 12 cents per word, as charged heretofore.

NEW LIST OF AMATEUR STATIONS.

The new list of "Amateur Radio Stations of the United States," edition June 30, 1922, is now available for distribution. The price of this publication is 25 cents per copy. All remittances should be forwarded to the Superintendent of Documents, Government Printing Office, Washington, D. C.

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